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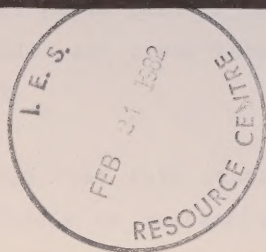
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PUBLIC PERCEPTIONS OF WATER QUALITY IN THE GREAT LAKES



PUBLIC PERCEPTIONS
of WATER QUALITY
in the GREAT LAKES

PLANNING DIVISION
Water Planning and Management Branch

OCTOBER, 1981



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PREFACE

This report documents the results and findings of a survey on public perceptions of water quality in the Great Lakes. The survey, conducted during February and March of 1978, was in response to a need identified by the Great Lakes Water Quality Board of the International Joint Commission to ascertain whether the public perceived any changes in water quality and to determine how the public was disposed towards remedial programs and efforts being devoted to meet water quality objectives.

The information presented on the following pages is based upon analyses of completed survey questionnaires which were originally done and used in earlier draft reports related to this project. As such, and to avoid further delay in disseminating the basic survey findings, this report has been somewhat restricted in its presentation. More insight on public perceptions could perhaps be generated by further examination of relationships and cross-tabulations between various responses of the public.

It is hoped that this report, be as it may, will provide those with interests or responsibilities in water quality management useful information on the public's perception of and attitudes towards water quality in the Great Lakes.

ABSTRACT

Three thousand and sixty-six residents of Southern Ontario were interviewed by telephone to obtain their responses to 39 questions pertaining to water quality and recreational use of the Georgian Bay through Lake Ontario portion of the Lower Great Lakes. The sample public was comprised of three groups: users and non-users, as distinguished by their relative frequency of participation in recreation on the Great Lakes; and shore property owners. The administered survey questionnaire was designed primarily to determine the public's perceptions and attitudes towards water quality and water quality management.

Over half (53%) of the sample public indicated their general dissatisfaction with the level of water quality in the lower Great Lakes. Forty-nine percent felt that water quality was deteriorating and 39% believed that it would be worse in the future, particularly in Lake Ontario and from Georgian Bay to Lake St. Clair. Lake Erie, which would be expected usually to fare worse than other lakes in the public's view, was seen to remain the same or improve in future water quality by about half of Lake Erie shore property owners and users.

Much of the public's perception of water quality was found to be influenced by personal observation and experience (e.g., appearance of water and aesthetics) and by the mass media (used by 65% of public as major source of water quality information). While the proportion of those unhappy with water quality was high, only a small segment of the respondents felt sufficiently concerned to lodge complaints (13% of shore property owners) or seek specific information on water quality (26% of survey respondents).

Participation in water-based recreation by the public has generally decreased, however, not as much due to water quality

or dissatisfaction with water quality as for more personal or economic reasons. Less than 30% of shore property owners and, similarly, recreational users of the Lower Great Lakes cited that deteriorating water quality influenced their decision to swim or fish less often.

About 3 out of every 5 respondents (59%) demonstrated a lack of awareness of government efforts and measures to improve water quality. While 80% knew of Environment Canada and the provincial Ministry of Environment, and 41% of the International Joint Commission, almost two-thirds did not know enough to comment on the performance of these three agencies. Moreover, only 1% of the public relied on government agencies as their major source of water quality information.

Half of those interviewed (54%) felt that the government was not doing enough to improve water quality in the lower Great Lakes and indicated their willingness to pay additional taxes in order to achieve better water quality (59%). These responses, however, likely reflected those of the public generally unaware of past or ongoing government efforts. The public identified the control of industrial pollution (30%) and general polluting (18%) as the most important means towards improved water quality.

RESUME

Lors d'une enquête téléphonique 3066 residents du Sud Ontario ont répondu à 39 questions concernant la Baie Georgienne et le lac Ontario, region Bas Grands Lacs. L'échantillonnage était composé comme suit: 1) les usagers; 2) les non-usagers (distingués les uns des autres par la frequence différente de leur participation récréatives sur les Grands-Lacs); et 3) les propriétaires riverains. Le questionnaire a été concu afin de déterminer la perception et l'attitude de ce public envers l'utilisation récréatives et la qualité de ces eaux.

Plus de la moitié (53%) des répondants ont indiqué leur mécontentement face à la mauvaise qualité de ces eaux. 49% perçoivent une détérioration constante et 39% perçoivent une détérioration croissante pour le lac Ontario et, de la Baie Georgienne au lac St. Clair. Cependant, le lac Erié, habituellement perçu comme étant le plus malenpoint des Grands Lacs, est maintenant considéré comme stationnaire ou s'améliorant par environ la mortié de ses propriétaires riverains et utilisateurs.

En general la perception du public envers la qualité des eaux est le fruit d'expériences et d'observations personnelles ou encore, provient des média d'information (pour 65% des répondants). Si la majorité se plaint de la piètre qualité de ces eaux seulement 13% des propriétaires se sentent sufisamment concernés pour porter plainte et 26% demandent des informations supplémentaires sur le sujet.

La participation aux activités aquatiques récréatives a diminué, il semble que cela soit dû à des raisons économiques et personnelles, et non à la mauvaise qualité de l'eau. Seulement 30% des propriétaires riverains et usagers ont soulignés la détérioration de l'eau comme raison à la diminuation ou cessation de leurs activités telles que la pêche ou la natation.

Environ 59% dénoncent un manque d'efforts de la part du gouvernement en vue d'améliorés la condition de l'eau. 80% connaissent Environnement Canada et le Ministère de l'Environnement (provincial) et 41%,

"International Joint Commission", mais environ 66% n'en savent pas assez pour commenter la pertinence de ces organismes ainsi que leurs occupations. De plus, seulement 1% du public utilise ces organismes comme leurs principales sources d'information.

54% des personnes interviewées pensent que le gouvernement n'agit pas efficacement pour l'amélioration de la condition des eaux de la région des Bas Grands Lacs, et 59% déclarent être prêts à payer un supplément d'impôt en vue d'obtenir une meilleure qualité de l'eau. Par contre, les réponses reflètent l'ignorance du public face aux efforts passés et présents du gouvernement. Finalement, 30% des répondants considèrent qu'un meilleur contrôle de la pollution industrielle et de la pollution en général (18%) sera la meilleure façon d'obtenir une qualité supérieure de leurs eaux.

ACKNOWLEDGEMENTS

This survey of public perceptions of water quality in the Great Lakes could not have been accomplished without the considerable effort made by numerous people in the very short span of three months to design and implement the survey. Jannine Barsband of Jackson, Smith, and Associates Inc., went well beyond contract terms in assisting with the design of the questionnaire and hiring and training of interviewing staff. Phil Stevens of Statistics Canada was also instrumental in the survey design and implementation, as were contributions from IWD, Ontario Region and Headquarters' staff. The important task of telephoning and interviewing the public by the interviewers warrants particular recognition and expression of thanks.

Special credit is due to Albert Eatock of the Policy Research and Social Analysis Division (now Planning Division, Water Planning and Management Branch) for assuming the leadership and overall supervision of this project and to other contributing staff of PR&SA. Lucy Krucko (then on term staff with PR&SA) is deserving of singular acknowledgement, not only for her responsibility and work in data reduction and analysis, but also for her writing of the preliminary report on this survey. Albert Eatock must similarly receive recognition for authoring earlier drafts of the report, and thus, for making the task of the undersigned somewhat easier.

Finally, enormous gratitude is bestowed upon Ruth Parr for her diligent work and perserverence in the many typings associated with the production of this report on the survey findings.

W. Bien

October, 1981.

PUBLIC PERCEPTIONS OF WATER QUALITY IN
THE GREAT LAKES

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1.0 SUMMARY OF PUBLIC PERCEPTIONS ON WATER QUALITY IN THE GREAT LAKES

Three thousand and sixty-six telephone interviews were conducted during February and March of 1978 to determine public perceptions and attitudes towards water quality and water quality management in the Georgian Bay through Lake Ontario portion of the Lower Great Lakes. The sample was randomly drawn from the Ontario population residing south of a line extending from Parry Sound to Ottawa, and included 461 owners of shore property within the sample area who were randomly drawn from a shore property owners list. In order to note potentially different perceptions of various groups of the public, the sample population was categorized for analysis into owners, users and non-users. Users and non-users were distinguished on the basis of their participation in some form of recreational use of the Great Lakes (i.e. an average of once a year during the five years preceding the survey). The questions posed to respondents during the telephone survey have been listed in Appendix A, while results are summarized in the following highlights.

1.1 Perception of Water Quality

Just over half of the public (53%) was found to be dissatisfied with the existing level of water quality in the Lower Great Lakes. Almost one third (31%), however, was satisfied with the water quality while 16% were indifferent or had no opinion. Compared with either users or non-users, shore property owners tended to be more satisfied with water quality in general.

Seventy percent of the survey respondents had some perceptions of water quality changing. Generally, the public based this perception on visual impressions of how the water appeared (for example: clear water, dirty water, presence or absence of dead fish). The largest proportion of those interviewed considered the change in water quality to be towards worse conditions, although at least one-fourth could not perceive the direction of water quality change. Over half of the public perceived Lake Ontario and Lake Erie as having deteriorated in water quality.

About one-in-every three respondents was able to perceive water quality change in some time context. Half of such respondents felt that water quality had changed for the worse prior to 1972. Among respondents indicating changes occurring over 1972-74 and 1975-78, the tendency was for most to perceive improving conditions, in each time period, respectively.

1.2 Shore Property Owners' Perceptions of Water Quality

Due to their lifestyle being more intimately associated with the water environment, shore property owners' perceptions might be considered to reflect a more sensitive awareness of water quality. The survey found that owners were almost equally divided between being satisfied and dissatisfied with the level of water quality. Only a small proportion (13%) of shore property owners had felt sufficiently strong about the state of water quality to officially complain to someone while a further 20% contemplated complaining.

In terms of their awareness of activities related to monitoring of water quality in their area, one half of the owner-respondents knew of water quality being checked (primarily by government agencies or private individuals). Less than one fifth of the owners was aware of any local citizens' groups in the area working towards improving water quality.

Shore property owners generally considered water pollution as their third-ranking major problem, following shore erosion and varying water levels. Almost one quarter of owners located on Lake Ontario and along Lake St. Clair to Point Pelee felt water pollution was a major problem. Industrial plants and public sewage were considered by owners to be the main factors having a negative impact on water quality. Thirteen percent identified power boats as having a negative influence and only a small number (3%) recognized any beneficial effects of government operations devoted to improve water quality.

1.3 Water Quality Effects on Recreational Use of the Great Lakes

Swimming, boating, and fishing comprised the fundamental water-based recreational activities on the Great Lakes for the sample public; shore property owners and users being those who participated most frequently. The general trend in participation noted for these activities (for owners and users) was towards a reduction in frequency as compared to a few years preceding this survey. From 30% to 50% of owners and users indicated that they now took part in swimming, boating, and fishing less often than they did in the past.

Water quality, as shown by this survey, has not for the most part been a very significant factor in affecting recreational use of the Great Lakes, particularly in reducing the frequency of participation by owners and users. Other reasons (time constraints, lifestyle change, age, health, costs) were given as the prime reasons for less participation in swimming, boating and fishing. Generally less than a third of the owners and users cited water quality conditions as a reason for reduced activity in swimming and fishing. Water quality tended to have very little impact on boating activity.

A fairly large number of owners and users felt that the quality of fish and the fishing experience in the Lower Great Lakes had diminished; this, in their view due to reduced quantities of fish and contamination of fish by chemicals and pollution.

1.4 Public Awareness and Attitudes Towards Water Quality Management

Only two out of every five respondents were aware of any government measures to improve water quality. Even of those who were aware, most could not identify any particular measure or specific effort. Pollution controls and septic system regulations were the most frequent example measures indicated by the respondents. Thirty-seven percent of the public were cognizant of the fact that they were using low phosphate detergent and only 1.5% were able to identify low phosphate detergent as a measure to improve water quality.

Since a significant portion of the public generally lacked an appreciation of existing government efforts, over half of the respondents felt that the government was not doing enough to improve Great Lakes water quality. They were equally dissatisfied with the adequacy of existing regulations governing water pollution and with efforts to enforce water pollution regulations. In their perceptions of measures required to enhance water quality, respondents identified the need for more stringent enforcement of laws and regulations, improving sewage/waste treatment, educating the general public, and ensuring that the United States does its share to improve water quality.

A majority of the sample public believed that environmental controls have beneficial or little effect on the economy. Almost two-thirds expressed their willingness to pay additional taxes in order to improve water quality in the Lower Great Lakes.

The fact that over half of the public thought that the level of government effort devoted to water quality improvement was inadequate can be considered a reflection of the relatively poor communication between the public and government regarding water quality. The major source of respondents' information on water quality was the mass media (65%) (newspapers, magazines, books; television, radio), while only 1% utilized government agencies. Only one quarter of those interviewed had made inquiries for information concerning water quality in the Great Lakes (sources contacted or likely to be contacted for specific information were government agencies).

Survey respondents were specifically asked whether or not they had heard of Environment Canada (EC) the Provincial Ministry of Environment (MOE), or the International Joint Commission (IJC). The overwhelming majority had heard of EC and MOE (80% in both cases); however, less than half (41%) knew of the IJC. Few of the respondents could offer any opinion regarding the performance of these agencies or relate to their role in water quality issues. Of those opinions which were expressed, most were generally favourable or gave recognition to the efforts of the three agencies.

1.5 Perception of Future Great Lakes Water Quality

The public tended to be somewhat divided in its outlook on the future quality of water in the Lower Great Lakes. Thirty-nine percent felt that the level of water quality would be worse than at present, while 35% expressed their belief that it would get better (13% thought it would remain unchanged).

Owners and users were asked to focus on portions of the Lakes more specific to their location or frequent use for a prospectus on water quality in the next several years. Owners generally expressed concern that water quality conditions in Lake Ontario, Lake Huron to Lake St. Clair, and Georgian Bay would worsen. They also expected water quality to improve along Lake St. Clair to Point Pelee, Point Pelee to Long Point and Long Point to Lake Ontario. Users were of a relatively similar opinion, although slightly differing on future water quality along Long Point to Lake Ontario which they felt would worsen.

A survey of the Canadian Lower Great Lakes Basin public's opinions and attitudes concerning water quality in the Great Lakes was conducted during February - March, 1978. This survey was in response to a need, identified by the Great Lakes Water Quality Board of the International Joint Commission, to ascertain whether the public perceived any changes in water quality of the Great Lakes and to determine how the public was generally disposed to the effectiveness of remedial programs and efforts being devoted to meeting the water quality objectives specified in the Canada/U.S. Great Lakes Water Quality Agreement (1972).

A total of 3066 people residing in Ontario, south of a line from Parry Sound to Ottawa, were interviewed for this study. The survey was designed to retrieve information which would allow the following study objectives to be met:

- (1) To determine the public's current perceptions and attitudes towards the water quality of the Lower Great Lakes;
- (2) To ascertain whether the public perceived any change in water quality over the 5 years preceding the survey;
- (3) To determine the criteria used most commonly by the public in assessing the quality of lake water;
- (4) To determine the trend in the public's use of the Lower Great Lakes shores and waters and the extent to which this has been affected by water quality;
- (5) To determine the public's awareness of, and attitudes towards, water management legislation and programs, water management agencies, and communication between water management agencies and the public; and

- (6) To identify the public's attitude and disposition towards efforts to improve Great Lakes water quality.

3.0 SURVEY SAMPLE

In the preparation of this survey of the public's perception of water quality in the Lower Great Lakes, three basic survey types were considered as being of potential use: telephone, postal, and personal interviews. The telephone survey was thought to be the most practical in terms of cost, time schedule, and reliability standards. The random telephone survey method selected also drew from 6 to 10% of unlisted telephone subscribers which other methods did not. A firm of consultant psychologists, Jackson, Smith and Associates, was contracted to assist in the design of the survey questionnaire (Appendix A) as well as the hiring and training of interviewers.

Interviewers were provided lists of computer-generated random telephone numbers with which to contact the public and request an interview. Interviews took place between 1:00 p.m. and 9:00 p.m. during work weeks and from 9:00 a.m. to 1:00 p.m. on Saturdays. Approximately, 10% of the interviews held were monitored by the survey supervisors or verified by a second telephone call. All completed interview questionnaires were scrutinized for completeness and quality, and to ensure that there was no duplication in the sample.

Of the 3474 successful contacts made by telephone to private residences and members of the public over 18 years of age in Southern Ontario, 2605 interviews were completed (75.0%). The rate of refusal for an interview amounted to 24.2%, while incomplete interviews accounted for only 0.8% of the telephone sample.

In addition to the 2605 respondents of the general public, a sub-sample of shoreline property owners was also included in the survey. Computer-generated random telephone numbers for shoreline property owners

(as identified in a list derived from the 1975, Canada/Ontario Great Lakes Shore Damage Survey) were used to contact the 461 owners who consented to and completed the interview questionnaire.

Shore property owners were grouped as to their location on the Great Lakes. These groupings were representative of 6 shoreline areas, as given in Table 3.1.

Of the total sample population, 85% was made up of the general public; this group of respondents was further differentiated to distinguish those who relatively frequently participated in some form of recreational activity on the Lower Great Lakes (i.e., "USERS") and those who did not (i.e., "NON-USERS"). Users were considered as those who participated an average of once a year during the five years preceeding the survey. On this basis, 45% of the general public were grouped as users of the Great Lakes with the remaining 55%, as non-users.

Demographic characteristics of the survey sample population were derived from the survey questionnaire. This information is summarized in the Tables 3.2 - 3.6, and is compared, where appropriate, to the relevant data from Ontario Statistics (1977) in order to obtain an appreciation of the representativeness of this survey sample.

Compared with a male/female ratio for the Ontario population of 49.6/50.4, the survey sample turned out somewhat biased towards male respondents (i.e., ratio of 54.9/45.1), and thus, was not entirely representative of the population from this aspect. This difference, however, would not be expected to affect the survey findings to any significant degree. The age distribution for all of the respondents represented remarkably well the Ontario distribution for age groupings, with 58% falling between 18-44 years.

People with high school and post-secondary education comprised the major portion of the survey sample (74.4%). People with 8 or fewer years of formal education were undersampled. This situation may be expected to bias the results of the survey to some degree, since other

TABLE 3.1: Distribution of Shoreline Property Owner - Respondents by Shoreline Area

Shoreline Area	Shoreline Property Owner-Respondents	
	Number	Percentage
Lake Ontario (to Ontario/Quebec Border)	89	19.3
Long Point to Lake Ontario	41	8.9
Point Pelee to Long Point	70	15.2
Lake St. Clair to Point Pelee	70	15.2
Lake Huron to Lake St. Clair	89	19.3
Georgian Bay	102	22.1
TOTAL RESPONDENTS	461	100.0

TABLE 3.2: Percentage Breakdown of Respondents by Sex

SEX	Owners (461)	Users (1172)	Non-Users (1433)	General Public (2605)	All Res- pondents (3066)	Ontario Statistic
MALE	41.0	59.0	56.0	57.3	54.9	49.6
FEMALE	59.0	41.0	44.0	42.7	45.1	50.4

TABLE 3.3: Percentage Breakdown of Respondents by Age

AGE (Years)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)	ONTARIO STATISTICS
18-24	9	26	15	20	17.5	18
25-29	5	18	11	14	12.0	10
30-34	6	15	13	14	12.0	10
35-39	7	11	9	10	9.3	10
40-44	8	8	8	8	8.0	10
45-49	9	8	7	7	7.8	9
50-54	12	6	9	8	8.8	8
55-59	12	4	7	6	7.3	7
60-64	10	2	6	4	5.5	5
65-69	11	2	7	5	6.3	4
70 +	12	1	8	5	6.5	8
MEAN AGE	51	35	44	40	42	43

TABLE 3.4 Percentage Breakdown of Respondents by Occupations

OCCUPATION	OWNERS (416)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
Professional	9	9	7	7.7	7.9
Semi-Professional	4	8	5	6.2	5.9
Managers	11	13	10	11.2	11.1
Clerical, Sales	8	11	10	10.3	9.9
Skilled	3	6	4	4.8	4.5
Semi-Skilled	6	10	11	10.4	9.7
Unskilled	4	9	11	9.8	9.0
Housewife, Student, } Retired, Unemployed, } Other	56	35	44	39.6	42.0

TABLE 3.5: Percentage Breakdown of Respondents by Education

	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
Part Grade School	11	10	22	16.5	15.6
Completed Grade School	10	9	11	10.0	10.0
Part High School	42	45	42	43.2	43.1
Completed High School	13	16	10	12.6	12.7
Part College/University	16	13	10	11.3	12.0
Completed College/University	8	7	6	6.4	6.6
Post Graduate	--	--	--	---	---

TABLE 3.6: Percentage Breakdown of Respondents by Type of Residence

	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
Apartment	6	20	21	20.5	18.4
Semi-Detached	2	8	7	7.5	6.6
Single Detached	90	67	65	65.9	69.5
Farm	2	5	7	6.1	5.5

surveys (CROP, 1978 and U.S. EPA, 1979) have shown that concern over environmental quality generally increases with the level of education.

Occupational groupings of the survey respondents tended to favour the housewives, students and others category (42%), while managerial to professional occupations (24.9%) and semi-skilled to clerical occupations (24.1%) were fairly evenly balanced. The majority of respondents (69.5%) lived in single-family dwellings; this being in fair agreement with the Ontario Statistics proportions of 60%.

4.0 PRESENT PERCEPTION OF WATER QUALITY IN THE LOWER GREAT LAKES

The first 3 questions of the survey questionnaire (Appendix A) served to basically introduce the subject of water quality to the respondent and to obtain initial insights into the public's perception of water quality in the Lower Great Lakes and whether or not they felt it is changing.

Tables 4.1 and 4.2 present the percentage breakdown of the public's responses to questions regarding satisfaction with existing water quality and water quality change. In addition to survey responses being indicated on the basis of owners, users, and non-users, as previously identified, owners and users have been aggregated to distinguish the perceptions of that portion of the public likely to be perhaps more aware of water quality in the Lower Great Lakes, as compared to the non-users. The general public responses consist of both users and non-users, reflecting the major sample population discussed in the preceding section.

Over half of the total survey respondents (53.2%) expressed dissatisfaction with the existing water quality of the Lower Great Lakes, while 15.4% were indifferent or could offer no opinion. Shore property owners were almost equally split between being satisfied (43.6%) and dissatisfied (44.6%). Users (those making recreational use of the Great Lakes an average of once per year over the five prior to the survey)

TABLE 4.1: Satisfaction with Existing Water Quality of Great Lakes (%)

SATISFACTION WITH WATER QUALITY AS IS	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
SATISFIED	33.5	43.6	29.6	29.0	29.3	31.4
NEITHER SATISFIED NOR DISSATISFIED	5.8	5.9	5.9	6.0	6.0	5.9
DISSATISFIED	56.7	44.6	61.6	49.0	54.7	53.2
NO OPINION	4.0	5.9	2.9	16.0	10.0	9.5

TABLE 4.2: Perception of Change in Water Quality (%)

IS WATER QUALITY PERCEIVED AS CHANGING	OWNERS & USERS (1631)	OWNERS (461)	USERS (1170)	NON-USERS (1425)	GENERAL PUBLIC (2595)	ALL RES- PONDENTS (3056)
YES	78.6	76.5	79.5	60.6	69.0	70.2
NO	11.9	14.8	10.7	13.8	12.5	12.8
DO NOT KNOW	9.5	8.7	9.8	25.6	18.5	17.0

tended to be the most dissatisfied (61.6%) in general. Non-users on the whole, were dissatisfied with a larger proportion (22%) unable to state a definite opinion.

Asked whether they felt the water quality is changing, 70.2% of all respondents agreed that it was changing. A significant majority of owners and users (78.6%) perceived the quality of water as changing. Question 3 of the questionnaire further probed the respondent's perception of the nature of this change; i.e., was water quality changing for better or worse. Survey responses to this question on a lake-by-lake basis are given in Table 4.3.

Only 22.6% of the respondents identifying a change in Great Lakes water quality thought that the quality of water was improving as opposed to 49.0%, almost half, which perceived a change towards poorer water quality. A larger proportion of the general public could offer no opinion for Lake Huron and Georgian Bay (29.0% and 29.4%, respectively) in comparison to their opinions on the other lakes. Nevertheless, the general public, by a margin of almost 2 to 1, felt that the water quality of Lakes Ontario, Erie, Huron and Georgian Bay was becoming worse. Again, owners and users, those who could be expected to have more intimate experience with these waters, tended to be slightly more optimistic towards water quality improvement in Lake Erie (30.1%) while having a stronger perception that Lake Ontario water quality had turned for the worse. Non-users once more conveyed a more negative perception of water quality change than either users or owners. The generally negative bias of non-users would tend to imply that their perceptions may be based upon news media reports which largely highlight pollution problems in the Great Lakes.

5.0 PERCEPTION OF WATER QUALITY CHANGE OVER TIME

Question 32 of the survey questionnaire sought to determine whether the respondents could relate a change in the general water quality of the Lower Great Lakes to a particular time. From among the total number of survey respondents, only about one-in-three (977) was able to provide some idea as to when water quality in general had

TABLE 4.3: Percentage Breakdown of Respondents' Perception of the Kind of Change in Water Quality of the Great Lakes

PERCEIVED CHANGE IN WATER QUALITY BY LAKE		OWNERS & USERS	OWNERS	USERS	NON-USERS	GENERAL PUBLIC	ALL RES- PONDENTS
LAKE ONTARIO (No. of Resp.)		537	87	450	859	1309	1396
	BETTER	28.8	25.3	29.5	23.8	25.9	25.8
	WORSE	49.9	41.4	51.6	59.5	56.7	55.8
	NO CHANGE	4.5	2.3	4.9	2.8	3.5	3.4
	DO NOT KNOW	16.8	31.0	14.0	13.9	13.9	15.0
LAKE ERIE (No. of Resp.)		396	161	235	859	1094	1255
	BETTER	30.1	34.8	26.8	22.0	23.0	24.5
	WORSE	43.2	36.0	48.1	55.0	53.5	51.2
	NO CHANGE	2.5	1.9	3.0	3.0	3.0	2.9
	DO NOT KNOW	24.2	27.3	22.1	20.0	20.5	21.4
LAKE HURON (No. of Resp.)		229	56	173	858	1031	1087
	BETTER	21.8	17.8	23.1	19.0	19.7	19.6
	WORSE	34.1	28.6	35.8	48.0	46.0	45.1
	NO CHANGE	6.6	5.4	7.0	5.0	5.3	5.3
	DO NOT KNOW	37.5	48.2	34.1	28.0	29.0	30.0
GEORGIAN BAY (No. of Resp.)		212	77	135	858	993	1070
	BETTER	22.6	19.5	24.4	19.8	20.5	20.4
	WORSE	32.1	27.3	34.8	46.6	45.0	43.7
	NO CHANGE	6.6	5.2	7.4	4.8	5.1	5.1
	DO NOT KNOW	38.7	48.0	33.4	28.8	29.4	30.8
ALL LAKES (No. of Resp.)		1374	381	993	862	1855	2236
	BETTER	25.8	24.4	26.0	21.2	22.3	22.6
	WORSE	39.8	33.3	42.6	52.3	50.3	49.0
	NO CHANGE	5.1	3.7	5.6	3.9	4.2	4.2
	DO NOT KNOW	29.3	38.6	25.8	22.6	23.2	24.2

improved or worsened. As shown in Table 5.1 and Figure 5.1, 50.3% of those responding to this question felt that the quality of water in the Great Lakes had changed prior to 1972.

More conscious and increased efforts to improve the water quality of the Great Lakes can be considered to have begun in 1972 with the signing of the Canada/U.S. Great Lakes Water Quality Agreement. It is interesting to note that most of the respondents to the above question identified the period prior to 1972 as the time when the water quality of the Great Lakes was generally poor. Respondents indicating periods over 1972-74 and 1975-78 (27.1% and 22.6%, respectively), as times when water quality changed, tended to convey a sense of improving water quality conditions. For 1972-74, the proportion of respondents perceiving a change for better or worse (10.3% versus 16.8%) markedly changed from that of prior to 1972 (5.9% versus 44.4%). For the period 1975-78, a greater number of respondents (13.4%) felt that water quality had improved.

The responses of owners and users to question 32 did not differ, basically, from the results based on all responses to this question. Owners and users tended to be almost equally spread in identifying water quality change in the three time period groupings (i.e., prior to 1972, 1972-74, and 1975-78), rather than focussing on one particular time as did the respondents in total. Owners and users also conveyed the impression that general water quality conditions were improving, although the latest period, 1975-78, did not show a consensus for better water quality as did the results for all respondents (i.e., 14.9%, better versus 14.3%, worse; compared to 13.4% and 9.2%, respectively, for all respondents).

6.0 FACTORS USED BY THE PUBLIC IN ASSESSING WATER QUALITY

Survey respondents were queried on the characteristics of water which convinced them of the level of water quality and influenced their opinion as to whether the water quality of the lakes was becoming better or worse. Responses to question 33 of the survey were not prompted by interviewers reading from a pre-set list. The public was left to

TABLE 5.1: Respondents' Opinion on Time of Water Quality Change

PERIOD IN TIME WHEN WATER QUALITY CHANGED IN GENERAL	ALL RESPONDENTS ABLE TO SPECIFY TIME OF WATER QUALITY CHANGE			OWNERS & USERS ABLE TO SPECIFY TIME OF WATER QUALITY CHANGE		
	(977)	BETTER	WORSE	(830)	BETTER	WORSE
PRIOR TO 1972	50.3	5.9	44.4	39.4	5.4	34.0
1972 - 1974	27.1	10.3	16.8	31.4	13.3	18.1
1975 - 1978	22.6	13.4	9.2	29.2	14.9	14.3
	100.0	29.6	70.4	100.0	33.6	66.4

GREAT LAKES WATER QUALITY



(i) All Respondents (977)

(ii) Owners & Users (830)

FIGURE 5.1 SURVEY RESPONDENTS' PERCEPTION OF TIME AND NATURE OF WATER QUALITY CHANGE

generally formulate and state their own criteria and these were later categorized based on similarity, into those characteristics shown in Table 6.1. Since the public chose to describe their indicators of water quality in terms of what they perceive to be either good water quality or poor water quality, the results have been correspondingly distinguished. Respondents were not limited as to the number of factors which could be mentioned in answering question 33.

The most important factor identified by the public, in determining their impression of lake water quality was the visual appearance of water: that is, whether it was clear, cloudy or dirty looking. If lake water was generally clear, well over a third of the public (38.0%; 34.0% of owners and users) was inclined to consider the water quality as being relatively good. Only about one quarter of the public, however, judged water quality to be poor, on the basis of cloudy or dirty water.

It can be noted that in assessing poorer water quality conditions, the responses of owners and users were almost identical to the total responses of the sampled public. In characterizing good water quality conditions, however, there were slight differences between the owners and users group and the total sample. These differences are likely attributable to the more direct involvement of the former group with the Great Lakes and, thereby, to impressions and/or expectations resulting from their experiences. It is also interesting to point out that water quality reports did not play as dominant a role in convincing the public of the level of water quality as did other factors, such as dead fish, garbage, algae, surface scum, odour, and fishing success - all basically sensory or experiential perceptions. Compared with owners and users, the public in general was somewhat more inclined, nevertheless, to be influenced by water quality reports.

7.0 SHORE PROPERTY OWNERS' PERCEPTIONS OF WATER QUALITY

As previously indicated, shore property owners made up a special interest sub-sample of the public. Approximately 15% (461) of the total survey sample public were owners of shoreline property. Owners of farms,

TABLE 6.1: Characteristics of Water or Related Aspects most Commonly Used by the
Public in Evaluating Water Quality (Percentage Breakdown)

CRITERIA USED IN PERCEPTION OF "GOOD" WATER QUALITY OR CHANGE FOR THE BETTER	OWNERS & USERS RESPONSES (607)	ALL RES- PONDENTS (743)	CRITERIA USED IN PERCEPTION OF "POOR" WATER QUALITY OR CHANGE FOR THE WORSE	OWNERS & USERS RESPONSES (1616)	ALL RES- PONDENTS (2601)
CLEAR-LOOKING WATER	34.0	38.0	CLOUDY OR DIRTY-LOOKING WATER	24.0	26.0
ABSENCE OF DEAD FISH	10.0	10.0	PRESENCE OF DEAD FISH	14.0	13.0
LACK OF GARBAGE AND DEBRIS IN WATER	9.0	7.0	PRESENCE OF GARBAGE AND DEBRIS	10.0	11.0
ABSENCE OF SURFACE SCUM	9.0	7.0	SURFACE SCUM VISIBLE	10.0	10.0
ABSENCE OF ALGAE	10.0	7.0	PRESENCE OF ALGAE	9.0	8.0
NO UNPLEASANT ODOUR	5.0	6.0	UNPLEASANT ODOUR	9.0	10.0
GOOD FISHING	4.0	6.0	POOR FISHING	4.0	3.0
WATER QUALITY REPORTS - FAVOURABLE	5.0	7.0	WATER QUALITY REPORTS - UNFAVOURABLE	3.0	4.0
ABSENCE OF WEEDS ON SHORE	3.0	3.0	WEEDS ON SHORE	3.0	3.0
ABSENCE OF WEEDS ON LAKE BOTTOM	2.0	1.0	WEEDS ON LAKE BOTTOM	3.0	2.0
LOW WATER LEVELS	3.0	2.0	HIGH WATER LEVELS	2.0	1.0
ABSENCE OF SCUM ON ROCKS	2.0	0.4	SCUM ON ROCKS	2.0	2.0
NO SIGN OF CHEMICALS	2.0	3.0	PRESENCE OF CHEMICALS SUSPECTED	2.0	2.0
ACTIVE BIRD LIFE	0.5	0.9	LACK OF BIRD LIFE	2.0	2.0
DO NOT KNOW	4.0	8.0	DO NOT KNOW	4.0	5.0

*NOTE: FACTORS IDENTIFIED ARE NOT MUTUALLY EXCLUSIVE; RESPONDENTS COULD
IDENTIFY MORE THAN ONE.

permanent residences or cottages along the shores of the Great Lakes can be considered as having a vested interest in the Great Lakes and its water quality. In terms of perception of many of the problems associated with the Great Lakes, moreover, shore property owners are more likely to be more sensitized to and have a more acute awareness of the nearshore water environment than average members of the general public. The perspectives and opinions of owners, therefore, provide a pertinent sub-focus for this survey on water quality and, thus, questions 6 to 16 in the questionnaire were devoted to obtaining information from them.

Table 7.1 identifies the geographic location of shore property owners by type of residence. The sample population of owners, for the most part, comprised those who owned cottages (49.7%) and permanent residences (48.8%). About 90% of these had owned their property for at least 5 years.

Summarizing some of the findings of the survey presented earlier (Tables 4.1 - 4.3), 88.2% of the owners surveyed expressed either dissatisfaction or satisfaction with existing water quality of the Great Lakes (almost in equal proportion, with a minor edge to more being dissatisfied); 76.5% felt that water quality was changing and that this change was generally towards worsening water quality. Significantly, with the exception of Lake Erie, shore property owners tended to be the least optimistic or pessimistic (compared to users and non-users) when attempting to identify change towards better or worse water quality on a lake by lake basis (Table 4.3). It is also surprising to some degree, that owners also had the highest proportion of those who did not know (38.6% on average for all lakes) which direction water quality was taking.

To reflect the shore property owners' concerns over water quality, the survey questionnaire asked owners to indicate whether or not they had lodged official complaints about water quality problems in their area (Table 7.2). Only 13.0% of the shore property owners had indeed complained about water quality while 86.6% had not. Interestingly enough, of those who had not complained about three quarters of them (74.9%) did not feel the situation was sufficient to tempt them to complain. Although the survey questionnaire did not attempt to delve

TABLE 7.1: Percentage Breakdown of Shore Owner Sample Population
by Lakeshore Area and Type of Residence

LAKESHORE AREA (No. of Owners)	RESIDENCE TYPE			
	COTTAGE	SINGLE FAMILY HOME	FARM/ COMMER- CIAL	ALL OWNER RESPOND
LAKE ONTARIO (To Ontario/Quebec Border) (89)	73.0	23.6	3.4	19.3
LONG POINT TO LAKE ONTARIO (41)	58.5	39.0	2.5	8.9
PT. PEELE TO LONG POINT (70)	80.0	20.0	---	15.2
LAKE ST. CLAIR TO PT. PEELE (70)	51.4	45.7	2.9	15.2
LAKE HURON TO LAKE ST. CLAIR (89)	14.6	85.4	---	19.3
GEORGIAN BAY (102)	34.3	64.7	1.0	22.1
TOTAL, OWNER-RESPONDENTS (461)	49.7	48.8	1.5	100.0

TABLE 7.2: Percentage of Shore Property Owners Who Have Complained About Water Quality or Have Been Inclined To Do So

OWNERS OFFICIALLY COMPLAINING ABOUT WATER QUALITY		RESPONDENTS (461)
HAVE COMPLAINED		13.0
DO NOT KNOW		0.4
HAVE NOT COMPLAINED		86.6
RESPONDENTS NOT COMPLAINING (399)	WERE TEMPTED TO COMPLAIN	23.1
	WERE NOT TEMPTED TO COMPLAIN	74.9
	DO NOT KNOW	2.0

TABLE 7.3: Shore Property Owners' Awareness of Water Quality In Their Area Being Checked (%)

OWNERS AWARE OF WATER QUALITY BEING CHECKED		RESPONDENTS (453)
AWARE OF WATER QUALITY CHECKS		49.0
NOT AWARE		28.5
DO NOT KNOW		22.5
SOURCES CONDUCTING CHECKS*		
LOCAL GOV'T (INCLUDES REG. HEALTH BOARDS)		18.5
PRIVATE INDIVIDUALS		16.7
PROVINCIAL GOVERNMENT		15.8
FEDERAL GOVERNMENT		11.7
RESPONDENT		11.3
OTHER		10.4
CONSERVATION AUTHORITY		5.0
RESIDENTS' ASSOCIATIONS		1.8
DO NOT KNOW		18.5

*ANY NUMBER OF SOURCES COULD BE IDENTIFIED.

further into circumstances surrounding reasons for complaint or non-complaint, it would generally appear that, for the proportion of shore property owners who expressed dissatisfaction with water quality levels (44.6%, from Table 4.1), just over one-in-four owners (29.2%) felt sufficiently strong about poor water quality to initiate some action. When taken together with those who were at least tempted to complain, however, three out of four owners (74.0%) expressing dissatisfaction could be considered to have demonstrated some concern over water quality.

Question 15 of the questionnaire asked whether or not shore property owners were aware of any efforts being made to check up on water quality in their area and who they thought was doing so. Almost half of the owner-respondents (49.0%) indicated that they knew of water quality being monitored, although 18.5% of these did not have any clear idea of who was responsible (Table 7.3). For those respondents who identified sources conducting water quality checks, 51.0% mentioned government agencies (local, provincial, federal, conservation authorities). In 40.2% of their responses, owners considered private individual or group interests to have been responsible for conducting water quality checks.

In Table 7.3, only a very small proportion of responses (1.8%) showed that local residents' groups were involved in monitoring water quality. Question 13 sought to determine what awareness shore property owners had, in general, regarding local citizens' groups which were working to improve water quality in their area. Less than one fifth (19.1%) of the owners (Table 7.4) stated that they knew of such local groups and 43.2% of these indicated that they belonged, or had belonged, to these groups. Given that 44.6% of the owners, as presented earlier, were dissatisfied with Great Lakes water quality and that 33.0% felt strongly enough to complain or contemplate complaining about water quality (13.0%, in fact, having done so), these findings on owners' awareness of and participation in local citizens' groups would convey the impression that there is not generally a strong commitment on the part of owners towards improving water quality. On the other hand, it may be

TABLE 7.4: Owners' Awareness of Local Citizens' Groups Working to Improve Water Quality (%)

OWNERS' AWARENESS OF CITIZENS' GROUPS		RESPONDENTS (461)
AWARE OF CITIZENS' GROUPS		19.1
NOT AWARE		78.1
DO NOT KNOW		2.8
OWNERS' AWARE OF CITIZENS' GROUPS	MEMBER OF GROUP	37.5
	NOT A MEMBER	62.5
OWNERS' AWARE, BUT NOT MEMBERS OF CITIZENS' GROUPS	PAST MEMBER	9.1
	NEVER BELONGED TO GROUP	90.9

that the majority of owners were relatively unconcerned with water quality (other than the fact of its being the focus for this survey) or were comfortable to let someone else (namely, government agencies) look after it.

Tables 7.5 and 7.6 present the responses of shore property owners to questions 10 and 12 of the survey questionnaire. These questions were intended to obtain their perceptions concerning the major problem facing residents along the shoreline in their area and whether they felt there was anything in the locale having an impact on the quality of water. Both questions were open-ended in that the respondents were left to volunteer their own answers.

Of the problems causing concern for shore property owners along the Great Lakes, one quarter (25.8%) of the respondents identified shore erosion. Fluctuating water levels (17.8%) were the second most common problem while water pollution problems ranked third (16.1%). In the responses of owners, however, general or overall pollution and pollution effects on health could be construed to be related to water quality. Unfortunately, further clarification on these responses was not provided so as to clearly see their intended relation to water pollution. Aggregation of the three pollution-related responses would result in 31.4% of the respondents identifying water quality problems, making it the most common major problem.

In terms of the locational distribution of the problems encountered, almost half of the residents on Lake Ontario (48.3%) felt water pollution or pollution related aspects were a concern; similarly, 28.6%, on the shoreline from Lake St. Clair to Point Pelee on Lake Erie; 32.6%, from Lake Huron to Lake St. Clair; and 34.4%, on Georgian Bay. By far the most number of responses indicating no problems came from shore property owners on Georgian Bay (28.4%).

Over half of the owner-respondents (54%) indicated that they were not aware of anything in their area which was having either positive or detrimental effects on water quality (Table 7.6). Of the 39% who were aware of something possibly impacting on water quality, 28.7% identified

TABLE 7.5: Shore Property Owners' Perceptions of Major Problems in Their Area (%)

MAJOR PROBLEMS PERCEIVED	LAKESHORE AREA						ALL OWNER RESPONDENTS (461)
	LAKE ONTARIO (89)	LONG PT. TO LAKE ONTARIO (41)	PT. PELEE TO LONG PT. (70)	LAKE ST. CLAIR TO PT. PELEE (70)	LAKE HURON TO LAKE ST. CLAIR (89)	GEORGIAN BAY (102)	
SHORE EROSION	13.5	51.4	41.4	31.4	33.7	4.9	25.8
VARYING WATER LEVELS	21.3	14.5	21.4	22.9	14.6	12.8	17.8
WATER POLLUTION	23.6	7.3	4.3	24.3	14.6	16.7	16.1
NO PROBLEMS	10.1	7.5	15.7	7.1	9.0	28.4	14.1
GENERAL OR OVERALL POLLUTION	21.3	14.5	4.3	1.4	13.5	12.8	11.7
OVER-CROWDING IN AREA	4.5	2.4	8.6	5.7	5.6	13.7	7.4
POLLUTION EFFECTS ON HEALTH	3.4	----	4.3	2.9	4.5	4.9	3.6
OTHER	2.3	2.4	----	4.3	4.5	5.8	3.5

TABLE 7.6: Shore Property Owners' Perception of Factors Having Either
a Positive or Negative Impact on Water Quality in Their Area(%)

OWNERS PERCEIVING FACTORS IMPACTING ON WATER QUALITY		OWNER RESPONDENTS (457)
YES		39.0
NO		54.0
DO NOT KNOW		7.0
*FACTORS IDENTIFIED	INDUSTRIAL PLANTS	28.7
	PUBLIC SEWAGE	26.4
	POWER BOATS	12.9
	OTHER FACTORS	12.9
	OTHER RESIDENTS	10.1
	TOURISTS	7.3
	GOV'T OPERATIONS TO IMPROVE WATER QUALITY	3.4
	MARINA	3.4
	NUCLEAR PLANT	2.8
	RESORT OR PRIVATE CLUB	1.7
	PUMP OUT STATION	1.7
	DO NOT KNOW	6.7

*ANY NUMBER OF FACTORS COULD BE VOLUNTEERED BY THE RESPONDENTS.

industrial plants and 26.4%, public sewage, as the major factors. Power boats ranked as the third (12.9%) most important influence perceived as causing poor water quality conditions.

Since the survey questionnaire failed to differentiate between positive and negative factors, it would appear that almost all of those identified in Table 7.6 are negative influences on water quality, with the exception of government operations to improve water quality. The large proportion of owner-respondents perceiving industrial plants and public sewage as the main factors affecting water quality can be considered consistent with the study findings of Barker (1968). In her study of beach pollution in the Toronto area, she concluded that the public tends to perceive industrial plants as being associated with contaminated and toxic wastes; and public sewage, with bacterial health hazard. It is also interesting to note that a total of 17.4% of the owners responding to this question felt other residents and tourists were factors affecting water quality.

8.0 EFFECTS OF WATER QUALITY ON RECREATIONAL USE OF THE GREAT LAKES

The survey sample population was asked to provide information concerning their forms and frequencies of participation in recreation on the Great Lakes. It was hoped that this information would provide some insight as to whether or not the public's perception of water quality had any bearing on changes in patterns of recreational use of the Great Lakes.

As stated previously, the general public portion of the survey sample was sub-categorized according to their participation (users) or non-participation (non-users) in recreational activities related to the Great Lakes. A total of 1172 indicated that they were users (average of once a year for past 5 years), while 1433 stated that they did not generally participate in any activities on the Great Lakes (as per question 5 in the survey questionnaire). Table 8.1 identifies the most frequent form or forms of participation by user-respondents in comparison with Ontario Statistics (1977), to again have some perspective on the representativeness of this sample.

TABLE 8.1: Percentage Breakdown of General Public-User Participation
in Recreational Activities on the Great Lakes

RECREATIONAL ACTIVITY	GENERAL PUBLIC -USER RESPONDENTS (1172)	ONTARIO STATISTICS (1977)
SWIMMING, SUN BATHING	75.8	66
PICNICING	43.8	60
BOATING OR SAILING	38.7	39
WALKING/HIKING	38.1	55/24
FISHING	37.2	38
CAMPING	34.1	29
RENTING A COTTAGE	14.9	46
OTHER	0.5	---

*More than one activity could be identified by respondents.

TABLE 8.2: Public Participation in Predominantly Water-Based
Recreational Activities (%)

PUBLIC PARTICIPATION IN ACTIVITIES	OWNERS (461)	USERS (1172)	GENERAL PUBLIC (USERS & NON USERS) (2805)	ALL RESPONDENTS (3066)
SWIMMING	84.4	70.1	32.0	40.0
BOATING	57.1	36.5	16.0	23.0
FISHING	64.0	40.5	18.0	25.0

*Activities are not mutually exclusive.

Based on this survey, 45% of the general public used the Great Lakes for recreation. Generally, the forms of participation identified by users are in reasonable agreement with the relative proportions indicated by Ontario Statistics (1977), with the exception of cottage rental. Over three quarters (75.8%) of the users took part in swimming or sun-bathing. Participation in other activities such as camping, fishing, walking/hiking, boating, and picnicing ranged from 34.1% to 43.8%.

Since water-based recreational activities such as swimming, boating, and fishing would be dependent on water quality conditions to a higher degree than others, these activities were followed up with further questions in the survey. Table 8.2 gives the percentage breakdown of participation in these activities by the total survey sample population while Table 8.3 presents the frequency of participation by owners and users.

As shown by these tables, by far the largest proportions of owners and users participated in swimming (84.4% and 70.1%, respectively). A large number of owners also went boating and fishing (57.1% and 64.0%, respectively) while user participation in these activities was some 20% lower by comparison (36.5% and 40.5%, respectively). The differences in participation in the latter activities are probably due to the owners having more opportunities to enjoy these leisure activities both in view of their typical age grouping (i.e. retirement or nearing retirement) and their proximity to the water. Users, on the other hand, would have to do some travelling to reach similar amenities or, also considering their age grouping (average, 35), would likely spread their leisure time over a greater range of activities. This aspect is, perhaps, brought out more clearly in the frequency of participation for owners and users. Almost three quarters of the users participated in swimming, boating and fishing (73.0%, 77.1%, 72.0%, respectively) from one to fifteen days per year (probably week-ends, vacations, and holidays), while owners spread their activities over a larger number of days.

TABLE 8.3: Frequency of Participation by Owners and Users
in Water-Based Recreation (%)

ACTIVITIES	NO. OF DAYS PER YEAR					
	1 to 15		16 to 50		OVER 50	
	OWNERS (461)	USERS (1172)	OWNERS (461)	USERS (1172)	OWNERS (461)	USERS (1172)
SWIMMING	29.1	73.0	31.9	22.0	39.0	5.0
FISHING	55.5	77.1	27.8	20.1	16.7	2.8
BOATING	43.1	72.0	32.9	23.0	24.0	5.0

TABLE 8.4: Change in Relative Frequency of Participation in
Recreational Activities (%)

ACTIVITIES PARTICIPATED IN		MORE OFTEN	SAME	LESS OFTEN	DO NOT KNOW
SWIMMING					
	OWNERS (393)	13.2	47.3	38.4	1.1
	USERS (830)	16.1	33.6	49.5	0.8
BOATING					
	OWNERS (300)	24.0	40.7	34.3	1.0
	USERS (480)	29.0	40.0	30.2	0.8
FISHING					
	OWNERS (297)	16.2	35.4	48.4	---
	USERS (431)	21.6	31.1	46.4	0.9

Questions 18, 19, and 20 of the survey questionnaire addressed changes that might have occurred in frequency of participation in swimming, boating, and fishing and reasons for these changes. Responses to these questions by owners and users are given in Tables 8.4 and 8.5; the latter broken down on a lakeshore area basis.

It will be noted from Table 8.4 that the net tendency for both users and owners over the few years preceding the survey has been to reduce the frequency of participation in the three water-based recreational activities. In swimming, about half of the owners (47.3%) indicated that they had not changed in the number of times they participated in the activity while 38.4% stated that they now did so less often. Only a third (33.6%) of the users had maintained the same pattern in swimming in comparison to 49.5% which reduced their participation. Similar changes towards less frequent activity in water-based recreation can be seen for boating and fishing, although the percent increase and decrease in user-boating are almost equal (29.0% versus 30.2%, respectively).

It is important to highlight that owners and users overwhelmingly identified other factors as being reasons for changes in patterns of participation in recreational activity (Table 8.5) rather than water quality. Some of these factors included: time constraints, change in life style, age, health, and increasing costs (particularly in conjunction with boating). Such factors were indicated in the responses of 67% of the owners and 64% of the users as reasons for taking part less frequently in swimming; 83% and 77%, owners and users, respectively for boating; and, 72% and 65%, owners and users, respectively for fishing.

Water quality was given as a reason for change in frequency of participation in fishing and swimming activities by just under one third of the owner/user-respondents, (swimming-owners, 31%; users, 34%; fishing-owners, 25%; users, 33%). Many of these respondents (ranging from 22 to 30%) cited worsened water quality conditions as being influential. These findings would suggest that, for at least some portion of the public, water quality is an important consideration from perspectives of its

TABLE 8.5: Reasons Given by Owners and Users for Change in Frequency of Participation by Lakeshore Area (%)

REASON FOR CHANGE IN ACTIVITY	LAKE ONTARIO		LONG POINT TO L. ONTARIO		PT. PELEE TO LONG POINT		LAKE ST. CLAIR TO PT. PELEE		LAKE HURON TO L.ST. CLAIR		GEORGIAN BAY		ALL RESPONDENTS	
	OWNERS	USERS	OWNERS	USERS	OWNERS	USERS	OWNERS	USERS	OWNERS	USERS	OWNERS	USERS	OWNERS	USERS
SWIMMING														
WATER QUALITY BETTER	6	4	3	7	32	12	16	5	3	1	3	3	9	4
WATER QUALITY WORSE	41	38	23	37	21	20	18	29	10	22	16	17	22	30
OTHER REASONS	49	56	74	56	47	64	66	65	83	76	81	80	67	64
DO NOT KNOW	4	2	--	--	--	4	--	1	4	1	--	--	2	2
BOATING														
WATER QUALITY BETTER	10	11	7	10	17	--	7	22	6	16	10	8	9	12
WATER QUALITY WORSE	12	11	2	2	11	9	7	5	--	7	3	6	6	8
OTHER REASONS	78	74	89	83	67	90	86	70	88	75	86	81	83	77
DO NOT KNOW	--	4	2	5	5	--	--	3	6	2	--	5	2	3
FISHING														
WATER QUALITY BETTER	--	9	3	7	--	--	--	2	4	2	6	2	2	5
WATER QUALITY WORSE	23	41	16	21	27	22	19	23	38	21	21	13	23	28
OTHER REASONS	77	49	77	72	73	78	74	70	54	75	73	80	72	65
DO NOT KNOW	--	1	4	--	--	--	7	5	4	2	--	5	3	2

potential effects on their health, aesthetics or aquatic life. The respondents generally felt that water quality was not as important a factor in determining participation in boating, as in swimming or fishing where more direct body contact with water is involved or indirectly through fish ingestion.

On the basis of lakeshore areas, Lake Ontario had the largest proportion of owners (41%) and users (38%) who were inclined to go swimming less often because of degraded water quality. While similar tendencies were noted for other lake areas, only owners located along Pt. Pelee to Long Point indicated more swimming activity due to improved water quality conditions.

The perception of poor water quality conditions in Lake Ontario is again highlighted under reasons given for changes in the frequency of participation in fishing. Twenty-three percent of the owners and 41% of the users, usually fishing on Lake Ontario, did so less often than in the past for reasons attributed to worsened water quality. Waters from Lake Huron to Lake St. Clair were also identified by a high proportion of owners (38%) and users (21%) as being less desirable for fishing.

As indicated previously, water quality has had relatively little effect on boating activity in the Lower Great Lakes. The one minor exception shown in Table 8.5 was for the area from Lake St. Clair to Point Pelee where 22% of the users stated that better water quality conditions influenced them in boating more frequently.

Table 8.6 summarizes the responses of owners and users who participated in recreational fishing to survey questions pertaining to fish quality. The majority of owner-user respondents (44%) felt that fishing, in terms of the quality of fish, had generally become worse. Although the questionnaire failed to differentiate between reasons for changes in sports fishing for better or worse, one-third (33%) of the respondents engaging in fishing attributed changes in fishing to fish

TABLE 8.6: Perceived Change in Quality of Fish in the Lower Great Lakes (%)

QUALITY OF FISH OR FISHING		OWNERS (269)	USERS (428)	ALL OWNER - USER RESPOND- ENTS (697)
IMPROVED		17.1	15.7	16.2
SAME		31.6	24.5	27.3
WORSE		39.0	48.1	44.6
DO NOT KNOW		12.3	11.7	11.9
REASONS FOR CHANGE*	QUANTITY OF FISH			33
	SPECIES OF QUALITY			13
	SIZE OF FISH			6
	FISH CONTAMINATION DUE TO CHEMICALS, POLLUTION			32

*Mutually exclusive.

TABLE 8.7: User/Owner Respondents who eat the Fish Caught (%)

RESPONDENTS EATING THE FISH THEY CATCH	OWNERS (267)	USERS (425)	OWNER USER RESPOND- ENTS (692)
YES	77.9	72.2	74.4
NO	22.1	27.3	25.6

quantity and almost another one-third (32%), to fish contamination by chemicals and pollution. Despite the perception of owners and users that fish quality was decreasing, three-quarters (74.4%) continued to eat the fish they caught (Table 8.7).

9.0 PUBLIC AWARENESS OF GOVERNMENT EFFORTS TO IMPROVE WATER QUALITY

With over half of the survey respondents (53.2% from Table 4.1) being dissatisfied with Great Lakes water quality, it is fairly important to know what their awareness is with respect to the efforts being made to improve water quality. The level of public awareness of these efforts can be expected to have some bearing on how the public regards water management and future trends in water quality.

Question 21 of the survey asked all respondents whether they were aware of any direct measures taken or being taken by the government to improve water quality and to identify such measures. As shown in Table 9.1, well over half of the respondents (55.5%) indicated that they were not aware of any efforts on the part of the government while only 40.6% were aware of such efforts. The responses of owners and users (44.6%) showed that they were generally more aware, but only by a slight margin. Users formed the group with the largest proportion (45.7%) being aware of measures to improve water quality. Non-users were the least overall informed members of the public (with 36.1% being aware).

Of the 40.6% of the survey respondents stating awareness of efforts to improve water quality, most (35.9%) confessed that they could not identify any particular measures. Those that were able, identified pollution controls (20.9%), septic system regulations (16.6%) and low phosphate detergents (3.6%). A further 25.9% of the responses mentioned the International Joint Commission and government agencies, which, for lack of clarification in the survey results, may be taken as water quality-related tasks undertaken by specific agencies.

Based on concerns over accelerating eutrophication in Lakes Erie and Ontario (early 1970's), the IJC urged both the Governments of Canada and the United States to take steps to reduce the phosphorus content of

TABLE 9.1: Public's Awareness of Government Measures to Improve Water Quality (%)

AWARE OF GOVERNMENT MEASURES	OWNERS & USERS (1630)	OWNERS (461)	USERS (1169)	NON-USERS (1427)	GENERAL PUBLIC (2596)	ALL RESPONDENTS (3057)
YES	44.6	41.9	45.7	36.1	40.4	40.6
NO	52.1	55.3	50.8	59.3	55.5	55.5
DO NOT KNOW	3.3	2.8	3.5	4.6	4.1	3.9
MEASURES IDENTIFIED* BY PUBLIC STATING THEY WERE AWARE OF EFFORTS BEING MADE (1242)	POLLUTION CONTROLS					20.9
	SEPTIC SYSTEM REGULATIONS					16.6
	INTERNATIONAL JOINT COMMISSION					15.1
	GOVERNMENT AGENCIES					10.8
	LOW PHOSPHATE DETERGENTS					3.6
	OTHER MEASURES					0.8
	NOT ABLE TO IDENTIFY ANY MEASURES					35.9

*Not mutually exclusive; any number of measures could be identified by respondents.

detergents and thereby help to control the input of this nutrient into the lakes. Because most jurisdictions in Canada and the United States did proceed almost immediately to implement detergent phosphorus controls, it would be reasonable to assume that a significant portion of the public would be aware of this measure to prevent further degradation in water quality since detergent use falls in the public-consumer domain. To further evaluate the public's awareness of controls designed to improve water quality, respondents were asked to provide information on their use of low phosphate detergent.

Table 9.2 presents the survey responses regarding low phosphate detergent use and percentage breakdown of respondents by sex, occupation, education and age. It will be noted that only 37.2% of the public were aware that they were currently using, or had in the past, used low phosphate detergent. Since phosphate levels in detergents had been restricted in Ontario by laws enacted in 1970 (20% max. content) and 1973 (5% max. content), 62.8% of the public were not aware or did not realize that they were, in fact, using low phosphate detergent (i.e. 24.0% stating no use and 38.8% who did not know). Drawing on results from Table 9.1, moreover, only 1.5% of the total sample public were able to relate detergent phosphorus control to water quality management.

As shown further in Table 9.2, the largest number of respondents who were aware of their use of low phosphate detergent were women (44.7%). In terms of other demographic characteristics, awareness of low phosphate detergent use was highly correlated to level of education. Half of those with partly or fully completed college or university (48% and 50%, respectively) realized that they were users of low phosphate detergent. Professional and semi-professional occupations were also characteristic of low phosphate detergent users (46% and 42%, respectively), probably reflecting higher educational attainment. Respondents in clerical/sales occupations, housewives, and others, similarly typified those more aware of their use of such detergent (43% and 40%, respectively), although in this case exemplifying the larger proportion of females likely to be found in these categories.

TABLE 9.2: Public's Use of Low Phosphate Detergent as a Measure to Improving Water Quality (%)

RESPONDENTS' USE OF LOW PHOSPHATE DETERGENT		YES (1121)	NO (722)	DO NOT KNOW (1167)
ALL SURVEY RESPONDENTS		37.2	24.0	38.8
RESPONDENTS BY SEX	MALE	31.3	22.3	46.4
	FEMALE	44.7	25.7	29.6
RESPONDENTS BY OCCUPATION	PROFESSIONAL	46*	21	38
	SEMI-PROFESSIONAL	42	27	31
	MANAGERS	37	21	42
	CLERICAL, SALES	43	23	34
	SKILLED	26	25	49
	SEMI-SKILLED	30	23	47
	UNSKILLED	22	29	49
	HOUSEWIFE, STUDENT, UNEMPLOYED, OTHER	40	24	36
RESPONDENTS BY EDUCATION	PART GRADE SCHOOL	23	29	48
	COMPLETED GRADE SCHOOL	30	28	42
	PART HIGH SCHOOL	39	24	36
	COMPLETED HIGH SCHOOL	42	22	36
	PART COLLEGE/UNIVERSITY	48	16	36
	COMPLETED COLLEGE/UNIV.	50	17	33
RESPONDENTS BY AGE	18 - 24	35	26	38
	25 - 29	35	28	36
	30 - 34	38	26	35
	35 - 39	40	22	38
	40 - 44	42	23	34
	45 - 49	45	19	35
	50 - 54	40	23	36
	55 - 59	40	21	39
	60 - 64	40	23	37
	65 - 69	29	20	49
	OVER 70	23	22	54

*Percentages have been rounded, therefore, totals do not add exactly to 100%.

Out of the 37.2% of the public who knowingly used low phosphate detergent, 83% (or 30.2% of the total public) were able to state when they started using the detergent. This information is shown in the frequency histograms of Figure 9.1. The large number of respondents who estimated the start of their use of the detergent during 1972 and 1973 may be indicative of the portion of the public who were more aware of the low phosphate detergent debate or had heard of phosphate legislation.

As pointed out earlier in this section, less than half of the sample population (40.6%) was aware of any government measures and efforts to improve the water quality of the lower Great Lakes. It will be recalled that a relatively similar proportion (49.0%) of shore property owners were aware of water quality checks being made. Thus, at least half of the respondents in this survey are generally uninformed about water quality monitoring or improvement programs. With this level of awareness, it may be expected that respondents' opinions on, or satisfaction with, the degree of government effort being devoted to water quality improvement will not be very positive. These results are presented in Table 9.3.

In answer to question 21 of the questionnaire regarding whether the government was doing enough to improve water quality of the lower Great Lakes, just over half (54.4%) of the respondents felt that not enough effort was being expended (Table 9.3). One-quarter (24.4%) answered in the affirmative, while the remainder (21.2%) offered no opinion. Members of the general public (users and non-users) comprised the largest portion of the sample population who felt that the government was not doing enough. Shore property owners in contrast tended to give the government more credit than users or non-users (29.1% agreed that the government was doing enough).

In terms of respondents' satisfaction with existing regulations pertaining to water pollution and the enforcement of those regulations, most (40.0% and 56.0%, respectively) were generally dissatisfied. A larger portion, however, indicated more satisfaction with existing regulations (31.8%) than with the enforcement of these regulations

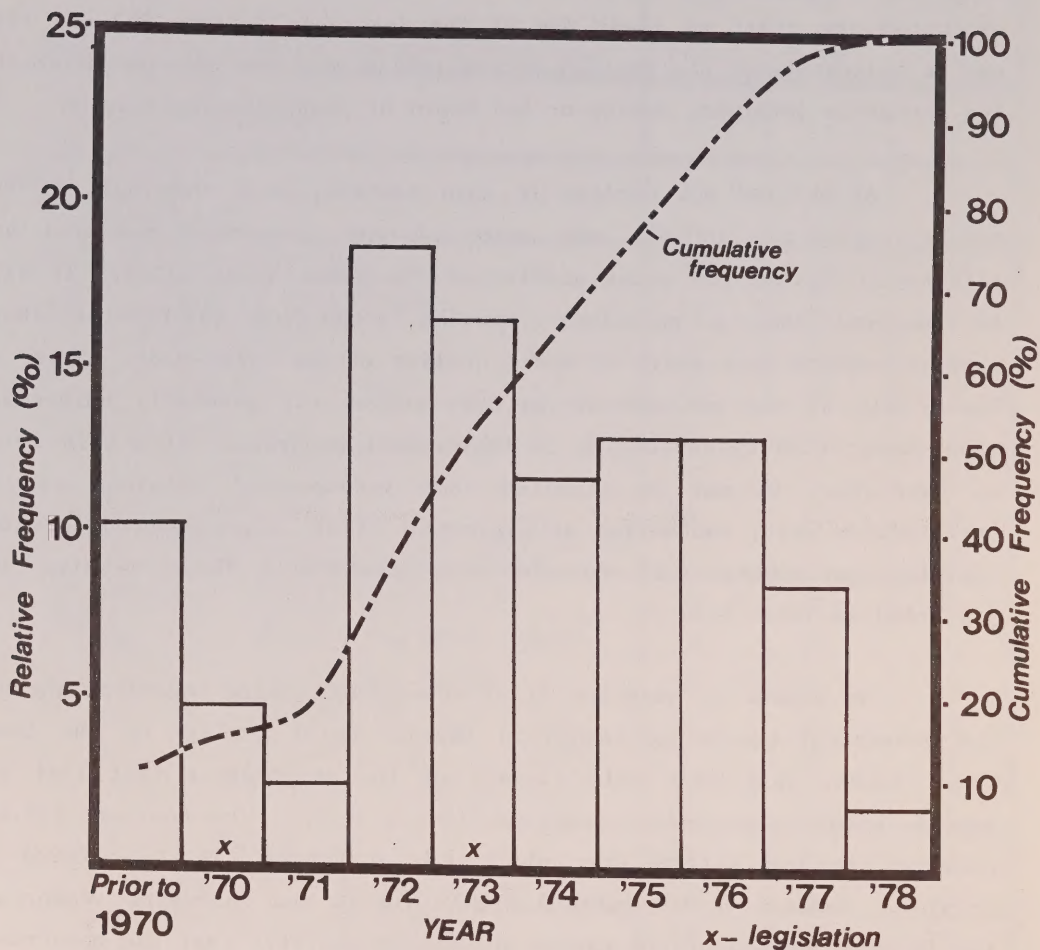


FIGURE 9.1 YEAR RESPONDENTS (930) ESTIMATED THEY BEGAN USING LOW PHOSPHATE DETERGENT

TABLE 9.3: Public Opinions on Level of Government Effort to Improve Water Quality (%)

GOV'T DOING ENOUGH TO IMPROVE LOWER GREAT LAKES WATER QUALITY	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RESPONDENTS (3066)
YES	24.7	29.1	23.0	24.0	23.6	24.4
NO	56.6	47.9	60.0	52.0	55.6	54.4
DO NOT KNOW	18.7	23.0	17.0	24.0	20.8	21.2
SATISFACTION WITH EXISTING REGULATIONS GOVERNING WATER POLLUTION						
SATISFIED	31.6	35.6	30.0	32.0	31.1	31.8
NEUTRAL	6.8	8.8	6.0	7.0	6.5	6.9
DISSATISFIED	42.7	36.9	45.0	37.0	40.6	40.0
NO OPINION	18.9	18.7	19.0	24.0	21.8	21.3
SATISFACTION WITH ENFORCEMENT OF WATER POLLUTION REGULATIONS						
SATISFIED	17.8	21.7	16.3	18.0	17.2	17.9
NEUTRAL	4.7	5.9	4.2	5.0	4.6	4.8
DISSATISFIED	59.6	52.7	62.3	52.0	56.6	56.0
NO OPINION	17.9	19.7	17.2	25.0	21.5	21.3

(17.9%). In both cases, users were the most dissatisfied (45.0% and 62.3%, respectively). Shore property owners, on the other hand, tended to be most satisfied (35.6% and 21.7%, respectively), although they were almost equally divided on the question of adequacy of existing water pollution regulations.

Overall, the survey results in this section present the conclusion that, while the public perceives that more government effort is required towards improving water quality through both improvement of regulations and, particularly, better enforcement of regulations, increased effort is also needed to raise the level of public awareness as to what is being done and the public's part in it. There may be, furthermore, an underlying truth that most of the public is relatively unconcerned with water quality, unless a problem happens to affect them more directly. Such a conclusion, perhaps, is not new but it underscores the need to have the public better appreciate and share water quality concerns.

10.0 PUBLIC ATTITUDES TOWARDS WATER QUALITY MANAGEMENT

In addition to obtaining a feel for the public's perception of water quality and their awareness of measures to maintain or improve water quality, it is equally important to know the public's attitude towards water quality management. A number of survey questions were designed to highlight public opinions on the means to improve Great Lakes water quality and attitudes towards efforts of various agencies.

Table 10.1 indicates the public's perceptions of the single-most important action which could be done to improve the water quality of the Lower Great Lakes. The most common suggestions made by the public were those identifying the need to eliminate, reduce or better control industrial pollution (29.9%) and to control pollution in general (17.7%). Another factor identified but related to the idea of pollution control was stricter enforcement of laws and regulations (8.6%). Improvement of sewage and waste treatment was supported by 7.9% of the respondents.

TABLE 10.1: Public's Perception of the Single Most Important Factor Needed to Improve Water Quality (%)

FACTOR IDENTIFIED	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
ELIMINATE OR REDUCE INDUSTRIAL POLLUTION	32.4	28.2	34.0	27.0	30.2	29.9
CONTROL POLLUTING	17.5	16.1	18.0	18.0	18.0	17.7
STRICTER ENFORCEMENT OF LAWS/REGULATIONS	10.0	10.0	10.0	7.0	8.3	8.6
IMPROVE SEWAGE/WASTE TREATMENT	8.7	13.0	7.0	7.0	7.0	7.9
EDUCATE GENERAL PUBLIC	8.5	6.9	9.0	6.0	7.4	7.3
STRICTER LAWS/REGULATIONS	3.2	3.9	3.0	3.0	3.0	3.1
CONTROL POLLUTION BY BOATS	3.5	5.0	3.0	3.0	3.0	3.3
ENSURE UNITED STATES DOES SHARE	3.2	3.9	3.0	2.0	2.5	2.7
DO NOT KNOW	13.0	13.0	13.0	27.0	20.6	19.5

It is interesting to note that 7.3% of all respondents advocated better education of the general public as a means of improving water quality: by users and owners (9.0% and 6.9%, respectively); by non-users (6.0%). Also of interest is the fact that the public perceived the need to control pollution by boats (3.3%) and to ensure that the United States does its share in improving water quality (2.7%). A total of 19.5% of the respondents could not suggest any factor or could not decide on a single most important one. The largest number of such responses came from non-users (27.0%).

Recognizing that most of the factors identified above involve environmental controls and costs, the public must necessarily show its acceptance and willingness to respond to the need. Question 37 attempted to evaluate the respondents' views on the effect of environmental controls on the economy; granting that should environmental controls be thought adverse to the economy, the public would be generally reluctant to support such measures. In the results of Table 10.2 however, the majority of respondents to this question believed that environmental controls would help the economy (52.0%) or thought that controls would not affect the economy (10.5%).

Question 23 of the survey questionnaire enquired whether respondents would be willing to pay additional taxes in order that the water quality of the Lower Great Lakes be improved. Table 10.3 presents the survey responses to this question as well as a breakdown of responses by demographic characteristics of the sample population.

Over half of the respondents (58.6%) indicated that they would, indeed, be willing to incur additional taxes if this would result in an improvement of the water quality of the Great Lakes. Approximately one-third (32.9%) stated that they would not be supportive of such means while 8.5% were undecided. Users and owners were most willing of the public to pay additional taxes (67.4% and 56.0%, respectively). Among the highlights of demographic factors which typify those more willing to pay are the following: both sexes were almost equally supportive of additional taxes (61% and 56%, respectively); higher occupational or

TABLE 10.2: Public Views on the Effect of Environmental Controls
on the Economy (%)

EFFECT ON ECONOMY	ALL RESPONDENTS (2990)
WOULD HELP ECONOMY	52.0
WOULD HAVE NO EFFECT	10.5
WOULD ADVERSELY AFFECT ECONOMY	17.8
DO NOT KNOW	19.1
REFUSED TO ANSWER	0.6

TABLE 10.3: Percentage Breakdown of the Public's Willingness to Pay
Additional Taxes in Order to Improve Lower Great Lakes
Water Quality

WILLINGNESS TO PAY ADDITIONAL TAXES		YES (1789)	NO (1006)	DO NOT KNOW (259)
ALL RESPONDENTS	(3054)	58.6	32.9	8.5
GENERAL PUBLIC (USERS + NON-USERS)	(2593)	59.0	32.6	8.4
NON-USERS	(1426)	52.2	37.8	10.0
USERS	(1167)	67.4	26.2	6.4
OWNERS	(461)	56.0	34.9	9.1
OWNERS + USERS	(1628)	64.2	28.7	7.1
RESPONDENTS BY SEX	MALE	61*	32	7
	FEMALE	56	34	11
RESPONDENTS BY OCCUPATION	PROFESSIONAL	70	25	5
	SEMI-PROFESSIONAL	75	20	5
	MANAGERS	63	31	6
	CLERICAL, SALES	62	30	8
	SKILLED	65	27	8
	SEMI-SKILLED	52	39	9
	UNSKILLED	56	35	9
	HOUSEWIFE, STUDENT, OTHER	54	36	10
RESPONDENTS BY EDUCATION	PART GRADE SCHOOL	43	46	11
	COMPLETED GRADE SCHOOL	54	34	12
	PART HIGH SCHOOL	61	31	8
	COMPLETED HIGH SCHOOL	68	27	5
	PART COLLEGE/UNIV.	71	23	5
	COMPLETED COLLEGE/UNIV.	67	25	8
RESPONDENTS BY AGE	18 - 24	70	20	10
	25 - 29	69	25	5
	30 - 34	68	24	8
	35 - 39	59	33	9
	40 - 44	61	33	6
	45 - 49	55	36	9
	50 - 54	60	33	8
	55 - 59	47	40	12
	60 - 64	38	51	11
	65 - 69	48	46	6
	OVER 70	33	55	12

*Percentages have been rounded, therefore, totals might not add to exactly 100%.

educational categories tended to be more supportive; and willingness to pay tended to decrease with age groupings. Younger adult age groupings from 18-34 (70%, 69%, 68%, respectively) were the most willing to pay which may reflect their concern over the future.

The results of this survey regarding willingness to pay for better environmental quality corresponds fairly well to other studies such as that of Delude-Cleft (1978) which found that about 57% of the public were amenable to paying additional taxes in contrast to 38% who were not. He also found that three quarters of the public were prepared to pay more for products that did not contribute to pollution.

11.0 SOURCES OF PUBLIC INFORMATION ON WATER QUALITY

It has been found elsewhere (Parlour and Schatzow, 1978) that the public's awareness of water management, attitudes, concerns, and opinions towards water quality issues are heavily influenced, if not generated, by the mass media. The extent to which this applies to the public's perception of water quality in the Lower Great Lakes is one further aspect dealt with in this survey.

Respondents were asked to identify their major source of information concerning water quality in the Great Lakes (Table 11.1). Almost two thirds (65.2%) of the respondents indicated that they relied on the printed and audio-visual media (i.e., mass media). Roughly the same proportion was observed for users (63.6%) and non-users (68.4%). It is interesting to note that half of shore property owners (51.0%) also relied on the mass media. Personal observation ranked second (20.2% of all respondents) behind printed media (47.6%) as the major source of information on water quality. As would be expected, owners (36.0%) and users (25.2%) comprised the largest segment of the public using personal observations. Unfortunately, only a very small number of respondents (0.9%) considered government agencies as their major source of information.

Question 26 of the questionnaire sought to ascertain what proportion of the sample public made inquiries for information on Great

TABLE 11.1: Respondents' Major Source of Information on Water Quality (%)

INFORMATION SOURCE	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
NEWSPAPERS, MAGAZ., BOOKS	46.4	44.0	47.3	49.0	48.3	47.6
PERSONAL OBSERV. & USE	28.2	36.0	25.2	11.0	17.4	20.2
TELEVISION, RADIO	13.7	7.0	16.3	22.0	19.4	17.6
OTHER PEOPLE	4.6	3.0	5.2	5.0	5.1	4.8
GOVERNMENT AGENCIES	1.4	2.0	1.2	0.5	0.8	0.9
WATER TESTS	1.2	3.0	0.5	0.1	0.3	0.7
EDUCATIONAL INSTITUTIONS	0.9	---	1.2	0.4	0.7	0.6
DO NOT KNOW	3.6	5.0	3.1	12.0	8.0	7.6

TABLE 11.2: Public Inquiries for Information on Great Lakes Water Quality (%)

INQUIRIES MADE IN THE 5 YEARS PRECEDING THIS SURVEY	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
YES	33.8	33.2	34.0	18.0	25.2	26.4
NO	65.3	66.2	65.0	81.0	73.8	72.6
DO NOT KNOW	0.9	0.6	1.0	1.0	1.0	1.0

ANSWERS
OBTAINED
TO
QUESTIONS

YES	31.2	39.2	28.1	22.9	26.0	28.5
NO	16.3	17.0	16.0	18.2	16.9	16.9
DID NOT TRY	52.5	43.8	55.9	58.9	57.1	54.6

EASE OF
OBTAINING
ANSWER

EASY	75.0	76.7	74.1	66.1	71.4	72.7
DIFFICULT	20.4	16.7	22.3	25.4	23.4	21.7
QUESTIONS NOT REALLY ANSWERED	4.6	6.6	3.6	8.5	5.2	5.6

Lakes water quality. As shown in Table 11.2, only one quarter (26.4%) of the respondents made such inquiries over the 5 years preceding the survey; one-third of the owners (33.2%) and users (34.0%) made inquiries. Based upon the number of respondents making inquiries, 28.5% obtained answers to their questions while over half (54.6%) did not try to obtain any answers. The majority of those obtaining answers to questions which they posed (72.7%) found it relatively easy to get satisfactory answers to their questions.

Members of the public, based on survey responses (Table 11.3), have in the past contacted, or are likely to contact, particular agencies for specific water quality information. Almost one quarter (23.5%) of the respondents indicated that the provincial government would be their first choice. A smaller proportion had contacted or would contact either the federal government (17.6%, including the Canada Centre for Inland Waters) or their local government (14.7%). One third (32.9%) of the respondents did not know whom to contact for water quality information while the remainder of respondents would turn to a number of other specific sources, such as: the Conservation Authority (4.7%), Canada Centre for Inland Waters (3.5%), Health Department (2.2%), and the International Joint Commission (0.5%). Recall from the preceding Table 151.1, however, that only 0.9% of the respondents considered government agencies to be their major source of general water quality information.

From Table 9.3, over half of the public interviewed (54.4%) expressed the opinion that government was not doing enough to improve the water quality of the lower Great Lakes. The federal Department of Environment (EC), provincial Ministry of Environment (MOE), and International Joint Commission (IJC) are three agencies directly involved with Great Lakes water quality. The majority of respondents (Table 11.4) had heard of both EC (80.0%) and MOE (80.0%), although less than half (41%) knew of the IJC. When asked, however, to give their impressions of these agencies in terms of efforts to improve water quality, the greatest segment of respondents knowing the three agencies could offer no opinion (EC, 57.7%; MOE, 59.2%; IJC, 44.4%). Considering, for example, that 20.0% of the public were unaware of EC and that a further 46.2% did not know enough to give an opinion, it can be seen that two thirds (66.2%) of

TABLE 11.3: Sources Contacted or Likely to be Contacted by Respondents
for Specific Water Quality Information (%)

SOURCES	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
PROVINCIAL GOVERNMENT	23.0	20.8	23.9	24.1	24.0	23.5
LOCAL GOVERNMENT	16.2	24.7	12.9	13.1	13.0	14.7
FEDERAL GOVERNMENT	13.3	11.7	13.9	15.1	14.6	14.1
CONSERVATION AUTHORITY	6.2	6.7	5.9	3.1	4.4	4.7
CANADA CENTRE FOR INLAND WATERS	3.9	3.7	3.9	3.1	3.5	3.5
HEALTH DEPARTMENT	3.0	5.9	1.9	1.1	1.5	2.2
INTERNATIONAL JOINT COMMISSION	0.7	0.2	0.9	0.1	0.5	0.5
OTHER	4.5	3.7	4.9	3.1	3.8	3.9
DO NOT KNOW	29.2	22.6	31.8	37.2	34.7	32.9

TABLE 11.4: Public Awareness and Impressions of Government Agencies
Concerned with Water Quality (%)

		AGENCY		
		FEDERAL DEPARTMENT OF ENVIRONMENT (3061)	PROVINCIAL MINISTRY OF ENVIRONMENT (3063)	INTER- NATIONAL JOINT COMMISSION (3057)
PUBLIC AWARE OF AGENCY				
YES		80.0	80.0	41.0*
NO		20.0	20.0	59.0
OPINIONS OF THOSE WHO KNOW OF AGENCY	FAVOURABLE OPINION	16.9	13.2	18.4
	TRYING	10.0	12.2	19.4
	UNFAVOURABLE OPINION	10.7	13.2	14.4
	OTHER**	4.7	2.2	3.4
	NO OPINION	57.7	59.2	44.4

*NOTE THAT 21.3% of those who have heard of the IJC felt that the United States was not performing at par with Canada.

**OTHER refers to opinions not related to agency's performance.

the public were uninformed or not knowledgeable about what EC does in relation to water quality. This similarly applies to MOE (67.4%) and even in greater proportion to the IJC (77.2%).

Of those who could offer some opinion of these agencies, over one-quarter was favourably disposed towards them or gave them credit for trying (EC, 26.9%; MOE, 25.4%). Over one third (37.8%) of the relatively smaller portion of the respondents knowing of the IJC felt likewise. Only a small number of the total public interviewed expressed any negative opinions of the three government agencies (DOE, 8.6%; MOE, 10.6%; IJC, 5.9%).

Given the fact, as brought out in this survey, that the majority of the public derives its information on water quality from the mass media (65.2%), it can be concluded that public perceptions of water quality are, indeed, highly influenced by this channel of communication. Communication between government agencies and the public appears to be deficient where the agencies are the direct sources of water quality information rather than secondary, as is typical of the mass media. It would be of much benefit to both the public and the government to improve their communication: to the public, by enhancing their awareness of water quality in the Great Lakes and of what is being done (and by whom) to improve water quality on their behalf; to government agencies, by increasing their public visibility and gaining public confidence in their efforts and work.

12.0 PUBLIC PERCEPTION OF FUTURE GREAT LAKES WATER QUALITY

Responses to this survey of the public's perception of water quality in the lower Great Lakes generally suggest that, while a significant proportion is dissatisfied with water quality conditions and support more stringent controls on sources of water quality problems, the majority of the public demonstrates that it is poorly informed, and not fully aware of water quality issues and management. When coupled with other factors, such as the public's perception that their use of the Great Lakes is relatively unaffected by water quality, the mass media's influence on their perception, and the lack of general public awareness

of government efforts to improve water quality, it is not difficult to understand that their outlook on future water quality in the Great Lakes tends to be somewhat pessimistic.

All respondents were asked about what they thought the water quality would be like over the next five years. Table 12.1 summarizes these responses while Table 12.2 focuses on those of owners and users of particular lakeshore areas.

Slightly over half of the respondents (52.2%) felt that water quality would be the same (12.8%) or worse (39.4%) over the next five years. Only one-third (34.6%) thought that it would improve. Owners, users, and non-users tended to be similarly divided between improvement in water quality or worsening of water quality. Shore property owners were more undecided (19.9%) than either users or non-users (12.0%).

Based on the perceptions of shore property owners and users of particular lakes and lakeshore areas, water quality in Lake Ontario would be expected to get worse (owners, 44.2%; users, 42.9%) and, as well in Georgian Bay (owners, 42.9%; users, 48.9%). Half of the owners (50.0%) and slightly more users (56.3%) felt that water quality along Point Pelee to Long Point would improve, as also in the Lake St. Clair to Point Pelee area (owners, 48.6%; users 47.7%). Opinions on future water quality for Long Point to Lake Ontario and for Lake Huron to Lake St. Clair tended to differ between owners and users. Figure 12.1 further portrays the perceptions of owners/users regarding future lake water quality.

TABLE 12.1: Public Perception of Future Great Lakes Water Quality (%)

WATER QUALITY	OWNERS & USERS (1633)	OWNERS (461)	USERS (1172)	NON-USERS (1433)	GENERAL PUBLIC (2605)	ALL RES- PONDENTS (3066)
WILL IMPROVE	34.4	30.2	36.0	35.0	35.4	34.6
WILL BE THE SAME	12.6	13.9	12.0	13.0	12.6	12.8
WILL BE WORSE	38.8	36.0	40.0	40.0	40.0	39.4
DO NOT KNOW	14.2	19.9	12.0	12.0	12.0	13.2

TABLE 12.2: Owners' and Users' Perceptions of Future Lake Water Quality (%)

LAKESHORE AREA		WATER QUALITY			
		TO IMPROVE	TO BE SAME	TO BE WORSE	DO NOT KNOW
LAKE ONTARIO	OWNERS (79)	26.0	18.2	44.2	11.6
	USERS (450)	38.9	13.1	42.9	5.1
LONG POINT TO LAKE ONTARIO	OWNERS (41)	43.9	7.3	31.7	17.1
	USERS (94)	38.2	12.8	39.4	9.6
POINT PELEE TO LONG POINT	OWNERS (36)	50.0	27.8	19.4	2.8
	USERS (32)	56.3	9.4	28.1	6.2
LAKE ST. CLAIR TO POINT PELEE	OWNERS (70)	48.6	8.6	34.2	8.6
	USERS (109)	47.7	12.8	34.0	5.5
LAKE HURON TO LAKE ST. CLAIR	OWNERS (46)	26.1	26.1	37.0	10.8
	USERS (173)	33.5	20.3	39.3	6.9
GEORGIAN BAY	OWNERS (77)	22.0	28.6	42.9	6.5
	USERS (135)	28.2	17.0	48.9	5.9

FUTURE WATER QUALITY TO BE:

BETTER

WORSE

SAME

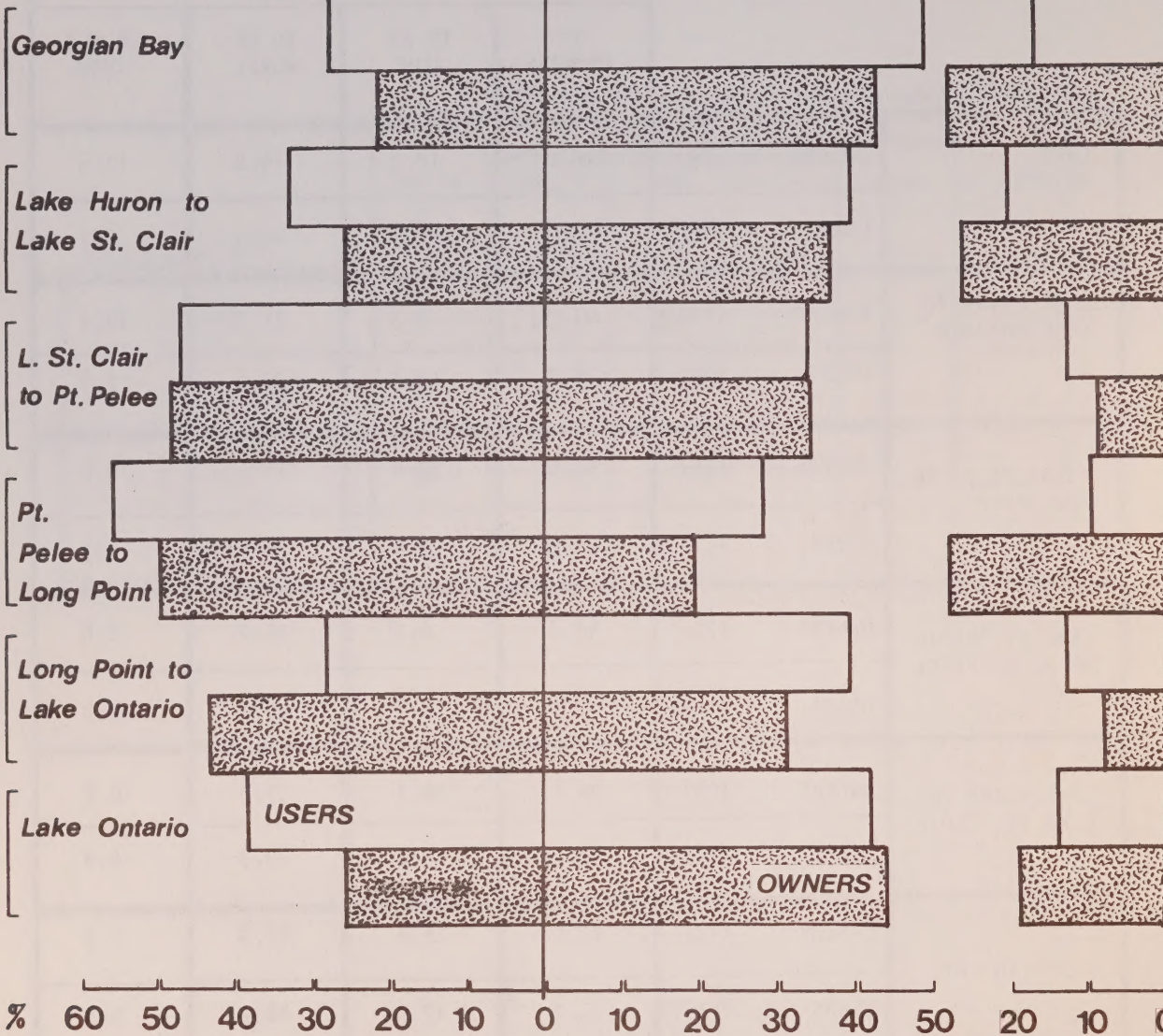


FIGURE 12.1 OWNERS' AND USERS' PERCEPTIONS OF FUTURE LAKE WATER QUALITY

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APPENDIX A SURVEY QUESTIONNAIRE

SCREEN

Time Started _____

Date _____

Card 1

COL 1

1

COL 2 3 4 5 6 7 8 9 10 11

Telephone # ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

COL 12 13

Interviewer # ☐ ☐

1. Using the following scale, how satisfied would you say you are with the quality of the water in the lower Great Lakes, that is, Lakes Ontario, Erie, St. Clair, Huron and Georgian Bay.

very satisfied	1	
quite satisfied	2	
somewhat satisfied	3	
neither satis. nor dissatis	4	COL
somewhat dissatisfied	5	14
quite dissatisfied	6	
very dissatisfied	7	
won't say or no opinion	9	

2. Do you feel the quality of the water in the Lower Great Lakes is changing?

Yes	1	
No	2	COL
Don't know	9	15

3. If yes, how is it changing? Is it getting better or worse?

	BETTER 1	WORSE 2	NO CHANGE 3	NO ANSWER 9	COL
Ontario	☐	☐	☐	☐	16
Erie	☐	☐	☐	☐	17
Huron	☐	☐	☐	☐	18
Georgian Bay	☐	☐	☐	☐	19
All	☐	☐	☐	☐	20

4. Do you currently own property on one of the Lower Great Lakes?

Yes	1	
GO TO QUESTION # 6		COL
No	2	21
GO TO NEXT QUESTION		

5. Have you used the shoreline along the lower Great Lakes for any of the following activities on the average of once a year for the last 5 years?

rent a cottage	1	22
camp	1	23
picnicking	1	24
sunbathing, swimming, water, skiing	1	25
walk, hike, jog, birdwatch	1	26
sail or boat	1	27
fish	1	28
other, please specify	☐	29

INTERVIEWER: IF RESPONDENT MENTIONS ANY USE OTHER THAN DRINKING WATER, GO TO QUESTION No. 17.

FOR ALL OTHER RESPONDENTS, GO TO QUESTION No. 21.

6. Where is your property located?

Lake Ontario	1	
Lake St. Clair thru Pt. Pelee ...	2	
Lake Erie { Pt. Pelee thru Long Pt.	3	COL
Long Pt. to Lake Ontario	4	30
Lake Huron	5	
Georgian Bay	6	

7. Is your waterfront property

a cottage or summer residence	1	
a permanent residence	2	COL
a farm	3	31
commercial property please specify	4	

8. Have you owned this property
- | | | |
|-------------------------|---|-----|
| less than 5 years | 1 | COL |
| more than 5 years | 2 | 32 |

9. In the last year how many days did you spend at your lakefront property?

COL	33	34	35
	☐	☐	☐

Interviewer: Please enter response in boxes on the right. A two digit answer should have one zero placed before it. A one digit answer should have two zeros placed before it — eg., 21 days would be entered as 021, 9 days as 009 and 120 days as 120.

10. What do you feel is the biggest problem for people along your shoreline? **PROBE**

COL	36	37
	☐	☐

11. Have you noticed any changes in the wildlife you see along your shoreline?

Yes	1	
No	2	COL
Don't know	9	38

If yes, in about what year did this change occur?

COL	39	40
	☐	☐

Interviewer: Enter year in boxes at right.

Would you say the wildlife has become		
much more plentiful and diverse	1	COL
somewhat more plentiful and diverse	2	41
somewhat less plentiful and diverse	3	
much less plentiful and diverse	4	
don't know	9	

12. Is there anything in the area of your waterfront property which you feel has an impact either positive or negative, on the quality of your water?

Yes	1	
No	2	COL
Don't know	9	42

If yes, what is it?

Interviewer: Do not read the following list.	COL
large industrial plant	1 43
nuclear plant	1 44
public sewage	1 45
marina	46
resort or private club	1 47
other residents	1 48
pump out station	1 49
government operation to improve water ..	1 50
tourists	1 51
power boats	1 52
other, please specify	☐ 53

don't know 9 (54)

13. Are you aware of any local citizens' groups working to improve water quality along your shoreline?

Yes	1	
No	2	COL
Don't know	9	55

If yes, are you a member?

Yes	1	
No	2	COL
Don't know	9	56

Have you ever been a member?

Yes	1	
No	2	COL
Don't know	9	57

If yes to either of the above,

COL	58	59
-----	----	----

In what year did you join? ☐ ☐

Interviewer: Enter two digit number in box on the right.

14. Have you ever made an official complaint about your water quality?

Yes	1	
No	2	COL
Don't know	9	60

If no, have you ever been tempted to?

Yes	1	
No	2	COL
Don't know	9	61

For yes to either of the above,

COL 62 63

When was this?

☐ ☐

Interviewer: Enter two digit number in box on the right.

To whom did you go or would you go to make a complaint about the water?

COL 64

☐

If yes, when did you start using this type of detergent?

COL 13 14

☐ ☐

Interviewer: Enter 2 digit number in boxes on right.

When did you stop?

COL 15 16

☐ ☐

Interviewer: Enter 2 digit number in boxes on right.

USERS ONLY

17. Which of the lower Great Lakes would you say you use most often?

Lake Ontario 1
Lake St. Clair thru Pt. Pelee ... 2
Lake Erie { Pt. Pelee thru Long Pt. 2 COL
 Long Pt. thru Lake Ontario 4 17
Lake Huron 5
Georgian Bay 6

Is there any specific location which you frequent most often and, if so, what is it?

☐ COL

18

In the last year, how many days did you spend at _____ (Interviewer: fill in name of lake respondent has given).

COL 19 20 21

☐ ☐ ☐

15. Does anyone check up on water quality in your area?

Yes 1
No 2 COL
Don't know 9 65

If yes, who?

Interviewer: Do not read the following list.

federal government 1 66
provincial government 1 67
local government 1 68
residents association 1 69
private individuals 1 70
respondent him/herself 1 71
Conservation Authority 1 72
other, please specify 1 73

_____ 9 74

16. Do you do any of the following and if so do you do them more or less often than you did 5 years ago?

	+	0	-	COL
	1	2	3	
scrape your boat	☐	☐	☐	75
use a filter on your water supply	☐	☐	☐	76
boil or treat your water	☐	☐	☐	77
bring water from the city	☐	☐	☐	78
treat your waste, ie., septic system	☐	☐	☐	79
other, please specify	☐	☐	☐	80

CARD 2 COL 1 ☐ 2

2 3 4 5 6 7 8 9 10 11
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

Do you now, or have you in the past, used a low phosphate detergent?

Yes 1
No 2 COL
Don't know 9 12

18. Do you or any member of your family use _____ (Interviewer: fill in name of lake respondent has given) for fishing?

Yes 1 COL

No 2 22

Go to question #19

If yes, how many days did you go fishing?

COL 23 24 25

☐ ☐ ☐

Interviewer: Please place zero's before any number less than 3 digits.

Compared to a few years ago, would you say that you fish

more often 1
 about the same 2 COL
 less often 3 26
 don't know 9

Interviewer: For any response other than "about the same" continue to next question.

What is the reason that the amount of time you spend fishing has changed?

reason given is related to
 water quality ☐
 (please specify)
 _____ COL
 _____ 27
 other 8
 don't know 9

Interviewer: If respondent gave a reason related to water quality, continue to next question.

Was there a specific time when you first began to notice this change? (fishing)

Yes 1
 No 2 COL
 Don't know 9 28

If yes, when was this?

COL 29 30
☐ ☐

Interviewer: Please enter 2 digit number.

Over the last few years, in terms of quality of the fish, do you think think fishing has

improved 1
 stayed the same 2 COL
 gotten worse 3 31
 don't know 9

Why? **PROBE**

_____ COL 32 33
 _____ ☐ ☐

Do you eat the fish you catch?

Yes 1 COL
 No 2 34

If no, why not? **PROBE**

_____ COL 35 36
 _____ ☐ ☐

19. Do you or any member of your family use _____

(name of lake) for **swimming**?

Yes 1 COL

No 2 37

Go to question #20

If yes, on how many days last year did you swim?

COL 38 39 40

☐ ☐ ☐

Interviewer: Enter 0's before any number less than 3 digits.

Compared to a few years ago, would you say that you swim

more often 1
 about the same 2 COL
 less often 3 41
 don't know 9

Interviewer: For any response other than "about the same" continue to next question.

What is the reason that the amount of time you spend swimming has changed?

Reason given is related to
 water quality ☐
 (specify)

_____ COL
 _____ 42

other 8
 don't know 9

Interviewer: If respondent gave a reason related to water quality, continue to next question.

Was there a time when you first began to notice this change?

Yes 1

No 2 COL

Don't know 9 43

If yes, when was this?

COL 44 45

☐ ☐

Interviewer: Enter 2 digit number.

20. Do you or any member of your family use _____

(fill in name of lake) for **boating**?

Yes 1 COL

No 2 46

Go to question #21

If yes, do you use a

power boat 1

sailboat, canoe or rowboat 2 COL
both 3 47

On how many days last year did you boat?

COL 48 49 50
☐ ☐ ☐

Interviewer: Place 0's before numbers of fewer than 3 digits.

Compared to a few years ago, would you say that in general you boat

more often 1
about the same 2 COL
less often 3 51
don't know 9

Interviewer: For any response other than "about the same" continue to next question.

What is the reason that the amount of time you spend boating has changed?

Reason given is related to
water quality 1
(specify) COL
_____ 52

other 2
don't know 9

Interviewer: If respondent gave a reason related to water quality, continue to next question.

Was there a time when you first began to notice this change?

Yes 1
No 2 COL
Don't know 9 53

If yes, when was this?

COL 54 55
☐ ☐

Interviewer: Enter 2 digit number.

Interviewer: If respondent has both a power and non-power boat, ask next question.

Do you use your non-power boat

more often 1
about the same 2 COL
less often 3 56
don't know 9
than your power boat?

21. Are you aware of any direct measures being taken by the government to improve water quality?

Yes 1
No 2 COL
Don't know 9 57

If yes, what are they?

Interviewer: Do not read list. COL
low phosphate detergent 1 58
IJC 1 59
improved septic system regulations 1 60
other, please specify ☐ 61

Don't know 9 62

22. Do you think the government is doing enough to improve water quality in the lower Great Lakes?

Yes 1
No 2 COL
Don't know 9 63

23. Would you be willing to pay additional money in taxes in order to improve the quality of the water in the lower Great Lakes?

Yes 1
No 2 COL
Don't know 9 64

24. How satisfied are you with the existing laws and regulations governing water pollution? (Not the extent to which they are enforced, just the laws themselves).

very satisfied 1
quite satisfied 2
feel neutral 3 COL
quite dissatisfied 4 65
very dissatisfied 5
don't know 9

How satisfied are you with the extent to which these laws are enforced?

very satisfied 1
quite satisfied 2
feel neutral 3 COL
quite dissatisfied 4 66
very dissatisfied 5
don't know 9

25. What would you say is your major source of information concerning the quality of the water in the lower Great Lakes?

Interviewer: Do not provide answers. Attempt to get **one** major source only.

television, radio 1
 newspaper, magazines, books, etc. 2
 personal observation & use 3 COL
 have tested it myself or had it tested 4 67
 talking to other people 5
 Who?, specify

 other, specify ☐

 don't know 9

26. In the last 5 years have you wanted to ask any questions about the quality of the water in the lower Great Lakes?

Yes 1
 No 2 COL
 Don't know 9 68

If yes, were you able to get answers to your questions?

Yes 1
 No 2 COL
 Didn't try 3 69

If yes, was it

easy 1
 difficult 2 COL
 no answer rec'd 3 70

INTERVIEWER: If respondent got no answer, ask if he would like us to put him in touch with someone who can answer questions.

What is your question?

_____ COL 71 72
 _____ ☐ ☐

27. To whom did you go or would you go to ask a question about water quality?

Interviewer: Do not read list. PROBE FOR FIRST CHOICE.

Conservation Authority 1
 federal government 2
 provincial government 3
 local government 4
 IJC 5 COL
 CCIW 6 73

in phone book 7
 other, please specify ☐

don't know 9

FOR PROPERTY OWNERS AND USERS ONLY,

28. What do you think will happen to the quality of the water in Lake _____ (name lake given by respondent) in the next 5 years?

improve a great deal 1
 improve somewhat 2
 stay the same 3 COL
 deteriorate somewhat ... 4 74
 deteriorate a great deal ... 5
 don't know 9

INTERVIEWER: DON'T READ →

FOR ALL RESPONDENTS,

29. What do you think will happen to the quality of the water in the lower Great Lakes **in general** over the next 5 years?

improve a great deal 1
 improve somewhat 2
 stay the same 3 COL
 deteriorate somewhat ... 4 75
 deteriorate a great deal ... 5
 don't know 9

INTERVIEWER: DON'T READ →

30. What do you feel is the single most important thing which can be done to improve the quality of the water in the lower Great Lakes?

_____ COL 76 77
 _____ ☐ ☐

PROPERTY OWNERS & USERS ONLY

31. Can you pinpoint a year when you felt that the quality of the water in Lake _____ (name lake given by respondent) changed?

Yes 1 COL
 No 2 78

CARD 3 COL 1 ☐ 3

2 3 4 5 6 7 8 9 10 11
☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐ ☐

If yes, when was this?

COL 13 14
☐ ☐

Interviewer: Please enter 2 digit number in boxes at right.

Did the water get better or worse?

better 1 COL
 worse 2 15

32. Can you pinpoint a year when you felt the quality of the water in the lower Great Lakes in general changed?

Yes 1 COL
No 2 16

If yes, when was this?

COL 17 18
☐ ☐

Interviewer: Please enter 2 digit number in boxes at right.

Did the water get better or worse?

better 1 COL
worse 2 19

33. What is it about the water that made you feel that way?

Interviewer: Do not read list.

COL
high water levels 1 20
algae 1 21
surface scum, foam, etc. 1 22
weeds on shore 1 23
weeds on lake bottom 1 24
dead fish 1 25
unpleasant smell 1 26
cloudy or dirty looking water ... 1 27
garbage 1 28
bugs 1 29
poor fishing 1 30
scum on rocks 1 31
other, please specify ☐ 32

don't know 9 33

34. Have you heard of the Federal Department of Fisheries and Environment?

Yes 1 COL
No 2 34

What is your impression of the Department?

PROBE

COL 35 36
☐ ☐

35. Have you heard of the Ontario Ministry of the Environment?

Yes 1 COL
No 2 37

What is your impression of them? PROBE

COL 38 39
☐ ☐

36. Have you heard of the International Joint Commission or the Great Lakes Water Quality Board?

Yes 1 COL
No 2 40

What is your impression of them? PROBE

COL 41 42
☐ ☐

37. What effect do you think environmental controls have on the economy?

no effect 1
help the economy 2 COL
retard the economy 3 43
don't know 4
Refused to answer 9

COL
Leave column 44 blank 44

38. Would you be willing to sit down with an interviewer and discuss your views on water management and public needs in greater depth at your convenience?

Yes 1
No 2 COL
Don't know 9 45

Interviewer, if answer is yes, read the following:

We will be selecting a certain number of people at random some time in the future. Should you be one of those selected, someone from our offices will be calling you to arrange an appointment.

39. Would you like to receive a summary of the findings of this survey?

Yes 1 COL
No 2 46

IF YES,

You can phone in for it, write in for it or give me your address now.

BACKGROUND INFORMATION

1. Sex of respondent:
- | | | |
|--------------|---|-----|
| male | 1 | COL |
| female | 2 | 47 |

2. Where do you live? (Place name of permanent residence)

_____ COL 48 49
☐ ☐

Do you know what county this is located in?

 COL 50 51 52
☐ ☐ ☐

Interviewer: Enter # from form

3. Do you live in
- | | | |
|-------------------------------------|---|-----|
| an apartment | 1 | |
| a semi-detached or town house | 2 | |
| detached house | 3 | COL |
| farm | 4 | 53 |
| decline | 9 | |

4. How many people live in your household?

How many are over 18? ☐ COL 54
☐ COL 55

5. What type of occupation are you in?

_____ COL 56 57
 _____ ☐ ☐

Interviewer: check form and insert appropriate number value in box.

6. What is the last year of schooling that you completed?

Grade 3	1	
4	2	
5	3	
6	4	
7	5	
8	6	
9	7	
10	8	
11	9	COL
12	10	58
13	11	59
14	12	
15	13	
16	14	
17	15	
over 17	16	
decline	99	

7. To which of the following age groups do you belong?

19-24	1	
25-29	2	
30-34	3	
35-39	4	
40-44	5	
45-49	6	COL
50-54	7	60
55-59	8	61
60-64	9	
65-69	10	
over 70	11	
decline	99	

8. Did you vote in the last election?

Yes	1	
No	2	COL 62
Decline	3	
Refused to say	9	

Time ended _____

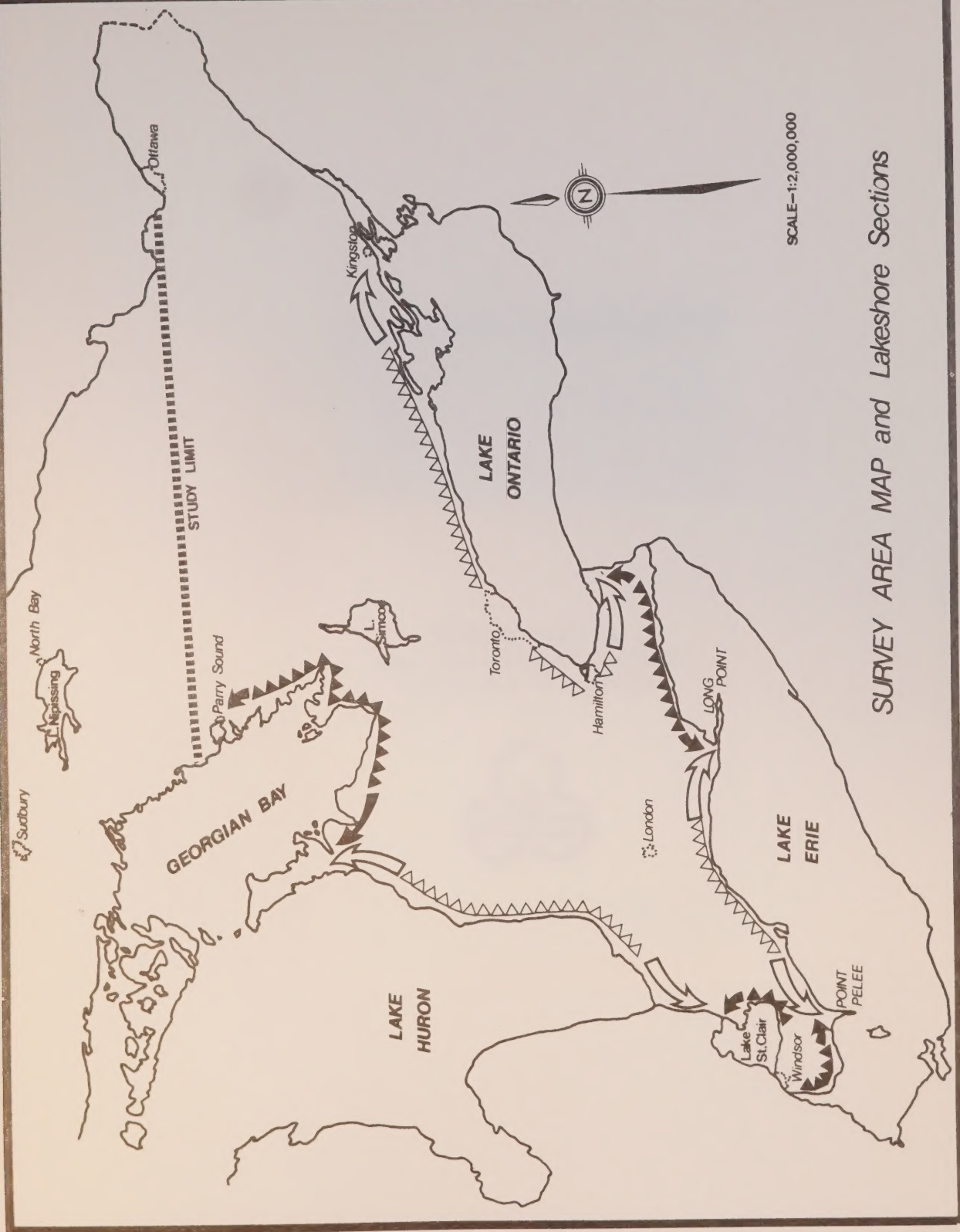
Length of interview _____

Type of Interview

Property owner	1	COL 63
User	2	
General public	3	

APPENDIX B

SURVEY AREA MAP



SURVEY AREA MAP and Lakeshore Sections

CA1 EP 75081P76

Canada. IWD.

PUBLIC PERCEPTIONS OF WATER QUALITY IN THE GRE
1981.

**RESOURCE CENTRE
INST. FOR ENVIRON'L. STUDIES
UNIVERSITY OF TORONTO**



